1/2 018 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--STATE OF THE SURFACE LAYER DURING ADSORPTION COMPLICATED BY A CHEMICAL REACTION -U-

AUTHOR-(02)-LYCHKIN, I.P., AZARYAN, D.T.

A

COUNTRY OF INFO--USSR

SOURCE--ZH. PRIKL. KHIM. (LENINGRAD) 1970, 43(3), 687-90

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--ADSORPTION, CARBON DIOXIDE, ETHYLENEDIAMINE, CHEMICAL REACTION, AMINE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/1635 STEP NO--UR/0080/70/043/003/0687/0690

CIRC ACCESSION NO--AP0125257

UNCLASSIFIED

2/2 018 UNCLASSIFIED PROCESSING DATE--30OCT70
CIRC ACCESSION NO--AP0125257
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ABSORPTION OF SO SUB2 PRESENT IN AIR, BY AQ. SOLNS. OF ETHYLENEDIAMINE AND ETHANOLAMINE CAUSED DISTURBANCES OF THE SURFACE LAYER WHICH WERE TRANSFORMED INTO CONVECTIVE STREAMING INTO THE CENTER OF THE SOLN. A LINEAR RELATION EXISTS BETWEEN THE RELATIVE AMT. OF ADSORPTION ON THE PHASE BOUNDARY OF THE GAS SOLN. AND 1-TAU, WHERE TAU IS THE TIME OF APPEARANCE OF THE DISTURBANCES.
FACILITY: KASP. VYSSH. VOENNO-MORSK. KRASNOZNAMENNOE UCHILISHCHE IM. KIRCVA, USSR.

UNCLASSIFIED

USSR

UDC: 539.4:624.012

BABAYAN, A. A., AZARYAN, R. G.

"Concerning the Question of Crack Resistance and Strength of Oblique Sections of Bendable Light Ferroconcrete Elements"

Sb. nauch. tr. Yerevan. politekhn. in-t (Collected Scientific Works. Yerevan Polytechnical Institute), 1970, 25, pp 74-79 (from RZh-Mekhanika, No 5, May 72, Abstract No 5V398)

Translation: The paper describes the testing of 16 ferroconcrete girders with concretes of grades 250 and 350 on a stone-and-pumice filler. The girders measured 200 x 24 x 15 [sic]. Class A-II reinforcement 14 and 16 mm in diameter was used. Bending tests were done by symmetric loading in two sections. Flexures, the width of opening of sloping cracks, and deformations of the concrete and the reinforcement were measured. It was found from the results that the crack resistance of supporting sections of the girders is ensured with fulfillment of the condition

$$Q < K_1 R_p b h_0,$$

where Q is the magnitude of the transverse force, R_p is the strength of the

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BABAYAN, A. A., AZARYAN, R. G., Sb. nauch. tr. Yerevan. politekhn. in-t, 1970, 25, pp 74-79

concrete under uniform tension, b and h_0 are the width and effective height of the cross section respectively, and K_1 is a constant assumed to be equal to 0.85. Destruction of the girders took place from brittle shear of the concrete in the compressed zone. The expression

$$Q_{max}=\frac{K_2 R_u b h_0^2}{C},$$

is taken as the basis for the limiting load in accordance with existing standards, where R_u is the bending compression strength of the concrete, and C is the projection of the sloping crack on the axis of the girder. According to experimental data, K_2 ranges from 0.101 to 0.134 and depends on the strength of the concrete, and also on the percentage of reinforcement. It is proposed for grade 250 concrete that K_2 should be taken as

$$K_2=\begin{cases}0.10 & \text{when } \mu<1.5\% \\ 0.12 & \text{when } \mu>1.5\%.\end{cases}$$

2/3

USSR

MUKHADZE, L. G., SEKHNIASHVILI, M. L., Stroit. mekh. prostranstven. konstruktsiy, Tbilisi, "Metsniyereba", 1972, pp 65-70

For the special case where the configuration of the contour follows the direction of the coordinate axes, and consists itself of two girders of rectangular cross section, a system of resolving integrodifferential equations is found for the formulated problem. Yu. P. Kitov.

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BABAYAN, A. A., AZARYAN, R. G., Sb. nauch. tr. Yerevan. politekhn. in-t, 1970, 25, pp 74-79

where μ is the percentage of reinforcement. It is noted that upper vertical cracks may appear on the support section. A criterion is proposed for evaluating the crack resistance of the upper zone, and recommendations are made on reinforcement of this zone. M. M. Kholmyanskiy.

USSR UDC 619:616.986.7:591.111:636.4

AZARYAN, R. P., Scientific Research Institute of Veterinary Medicine of the North Caucasian Zone

"Blood Parameters in Sows with Leptospirosis"

Moscow, Veterinariya, No 11, 1972, pp 62-63

Abstract: The dynamics of red blood cells, hemoglobin concentration, blood sugar, total protein, and protein fractions was traced in sows infected with a virulent culture of leptospira pomona 3 to 4 hours from the time of infection The RBC count and hemoglobin level were found to be lower in experimental animals than in controls throughout pregnancy and lactation. The blood sugar level was also lower, especially during the first 3 weeks after infection. The amount of total protein decreased during pregnancy but increased slightly during lactation. The alpha, beta, and gamma globulin levels exhibited a similar pattern. The various morphological and biochemical shifts observed in the blood of sows are factors worth considering when diagnosing leptospirosis and determining its intensity.

1/1

USSR

UDC 621.316.721

AZAT'YAN, G.A., BELEN'KOV, N.M., YERMOSHIN, V.D., KOMAROV, L.I., KURNOSOV, A.I.

"Analysis Of Operation And Production Technology Of Current Regulator"

Elektron. tekhnika. Nauchno-tekhn. sb. Poluprovodn. pribory (Electronic Technology. Scientific-Technical Collection. Semiconductor Devices), 1970, Issue 3(53), pp 67-72 (from RZh--Elektronika i yeye primeneniye, No 1, January 1971, Abstract No 1B477)

Translation: The circuit is considered of a current regulating two-terminal network using transistors and semiconductor diodes, which is intended to be accomplished as a hybrid microcircuit. The production technology for the hybrid circuit is considered and its parameters are cited. 5 ill. 5 ref. S.D.

1/1

USSR UDC: 541.126

AZATYAN, V. V., GONTKOVSKAYA, V. T., and MERZHANOV, A. G.

"Conditions for the Origin of Thermal Explosion in the Course of a Chain-Branching Reaction"

Novosibirsk, Fizika goreniya i vzryva, No 2, 1973, pp 163-169

Abstract: Using the example of one of the kinetic systems of heat explosions in complex chemical reactions, the authors consider the critical conditions of the explosion in the course of chain-branching reactions with uniform breaks of the chain. The effect of spontaneous heating on the process with no thermal explosion is also examined. The temperature gradients and the concentrations of the active centers of the chains in the reaction space are not taken into account; the part played by these gradients and the errors involved in averaging the temperature field are to be dealt with in another paper. This theoretical analysis begins with a system of six equations representing the reaction mechanism; from these is obtained a system of kinetic differential equations which was solved, together with the equation of thermal equilibrium, on an electronic computer.

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USSR UDC 541.127

AZATYAN, V. V., Institute of Chemical Physics, Academy of Sciences, USSR
Moscow

"Study of the Gasseous Phase Reactions in a Stream With Consideration of Linear Diffusion"

Moscow, Doklady Akademii Nauk SSSR, Vol 203, No 1, 1972, pp 137-140

Abstract: A method of calculating the diffusion of reacting particles along the stream is described based on the kinetics of homogeneous and heterogeneous reactions of the first order. One method of calculating the kinetics of the first order with consideration of longitudianl diffusion is based on literature reports in which excess molecular reagent was added to a stream of atomic material diluted with inert gas, after the stream emerges from the reactione zone, the relative concentration of the atomic material is dctermineed. Then the molecular reagent is replaced with inert gas. This permits calculations of the gasseous phase reactions without the value for the diffusion coefficient. Another method for studying reaction kinetics employs a constant initial concentration of components, varying the stream velocity. The kinetics of heterogeneous recombination with consideration of diffusion may be studied

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AZATYAN, V. V., Doklady Akademii Nauk SSSR, Vol 203, No 1, 1972, pp 137-140

by the method in which the rate of the gas addition into the discharge area is monitored and maintained constant, varying the reaction time by pressure changes in the reaction vessel.

2/2

USSR UDC 541.126.4:546.21+541.515:542.978

AZATYAN, V. V. and ROMANOVICH, L. B., Institute of Chemical Physics, Academy of Sciences USSR

"Reactions of O Atoms and OH Radicals With An Inhibitor in the Ignition Limits Method"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 5, 1971, pp 941-946

Abstract: The ignition limits method is a familiar technique in studying reaction kinetics of atomic hydrogen with various compounds. When rate constants are calculated it is assumed that of all the active centers of chains only atomic hydrogen reacts with the additive (RH) molecules: H + RH = H_2 + R (5). But reactions of O atoms and OH radicals with the inhibitor: O + RH = OH + R (6), OH + RH = H_2O + R (7) are not taken into account when determining the rate constants of hydrogen atom reactions. Still, in bulk reactions of O atoms, reaction (6) represents 13-30% at maximum additive concentrations and mean experimental temperatures. Therefore results that omit reactions (6) and (7) are often distorted. The mechanism of the reaction of O and H atoms and OH radicals in the presence of ethane suggests the importance of reactions (6) and (7). Experiments were conducted using ethane in a mixture of H_2 and O_2

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AZATYAN, V. V. and ROMANOVICH, L. B., Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya. No 5. 1971, pp 941-946

where the ethane content was varied from 0.37 to 0.58%, and the H_2 content -- from 48.1-75.2%. The ratio $[C_2H_6]/[H_2]$ in all mixtures was $7.7 \cdot 10^{-3}$. The experiments were conducted in the 567-665° range. The lower limits of ignition of H_2/O_2 mixtures with different ethane content were plotted. The rate constants of the reaction $H + C_2H_6 = H_2 + C_2H_5$, determined by the proposed method, is $7.9 \cdot 10^{13} \exp(-9600/RT)$ $cm^3 \cdot M^{-1} \cdot sec^{-1}$. It was possible to account for reactions of all types of active centers of chains with the inhibitor when studying the kinetics of reactions of H atoms by the ignition limits method.

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1/2 021 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--CALCULATION OF REACTIONS FOR ALL TYPES OF ACTIVE CENTERS REACTING WITH MOLECULES OF AN ADDITIVE USING A FLAMMABILITY LIMIT METHOD -U-

AUTHOR--AZATYAN, V.V.

COUNTRY OF INFO--USSR

SOURCE--KINET. KATAL. 1970, 11(1), 239-41

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--CALCULATION, FLAMMABILITY LIMIT, CHEMICAL REACTION RATE, HYDROGEN, HYDROXYL RADICAL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1997/0832 STEP NO--UR/0195/70/011/001/0239/0241

CIRC ACCESSION NO--AP0119736

UNCLASSIFIED

2/2 021 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0119736

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AN IMPROVED VARIANT OF THE FLAMMABILITY LIMIT METHOD IS PROPOSED WHICH ALLOWS THE PROCESS H PLUS RH EQUALS H SUB2 R, AND THE REACTIONS O PLUS RH EQUALS OH PLUS R AND OH PLUS RH EQUALS H SUB2 O PLUS R TO BE CONSIDERED IN THE MECHANISM. IT IS NOT NECESSARY TO KNOW THE RATE CONSTS. OF THE LAST 2 REACTIONS TO DET. THE RATE CONST. OF THE 1ST PROCESS. IF CHAIN TERMINATION TAKES PLACE IN A DIFFUSION REGION OF THE REACTION, THE CALCN. OF THE RATE CONST. DOES NOT INVOLVE THE COEFF. OF HETEROGENIOUS RECOMBINATION OF H ATOMS.

FACILITY: INST. KHIM. FIZ., MOSCOW, USSR.

UNCLASSIFIED

UDC 621.371.029.6

USSR

RZHEVSKIY, V. V., KORENBERG, Ye. B., ORLOVSKAYA, E. D., and AZBEL', M. D.

"Propagation of Broad-Band UHF Signals in Tunnels and Shafts"

Moscow, V sb. X Vses. konf. po rasprostr. radiovoln. Tezisy dokl. Sekts. 6 (Tenth All-Union Conference on the Propagation of Radio Waves; Report Theses; Section 6--collection of works) "Nauka," 1972, pp 64-67 (from RZh--Radiotekhnika, No 10, 1972, Abstract No 10A392)

Translation: Experiments investigating the passage of pulse signals in the tunnels of the Moscow subway are described. Triangular radio pulses 0.08 μs wide at half value were used, with a period of repetition at 200 μs, on a carrier frequency of 2200 MHz. To detect distortions of broad-band signals, television images were transmitted along shafts and in the tunnel of the subway. Results of the experiments showed that the distortion of the pulse fronts did not exceed 0.02 μs; the multibeam nature of the propagation has no effect on the accuracy of TM signal transmission; the quality of the TV transmission is good. Three illustrations, bibliography of one. N. S.

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USSR UDC 621.371.029.6

RZHEVSKIY, V. V., KORENBERG, Ye. B., ORLOVSKAYA, E. D., and AZEEL', M. D.

"Experimental Investigation of the Propagation of UHF Radio Waves in Tunnels and Mine Shafts"

Moscow, V sb. X Vses. konf. po rasprostr. radiovoln. Tezisy dokl. Sekts. 6 (Tenth All-Union Conference on the Propagation of Radio Waves; Report Theses; Section 6--collection of works) "Nauka," 1972, pp 68-72 (from RZh--Radiotekhnika, No 10, 1972, Abstract No 10A393)

Translation: The investigation was conducted in tunnels of the subway, lined with tubing (circular cross section) and in mine shafts (rectangular cross section), sunk in gypsum strata. Results of the measurements showed that in rectilinear paths, the attenuation is comparatively low; this permits use of UHF waves for the transmission of information along shafts. In paths with turns, there is a substantial addition to the weakening of the field, and retranslators are needed for the transmission of information. Four illustrations. N. S.

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USSR UDC: 621.396.2:621.371.1

AZBEL', M. D.

"Using Broad-Band Signals for Communication in Mines at UHF"

V sb. Shakhtn. radiosvyaz' (Mining Radio Communication--collection of works) Moscow, 1970, pp 5-10 (from RZh-Radiotekhnika, No. 3, March 71, Abstract No. 3A248)

Translation: Distortions are studied in the information transmitted in communications systems inside mines. An analysis is made of methods of reducing these distortions connected with the multibeam nature of the propagation. The advantages of using broad-band signals (on the example of industrial television) are demonstrated. N. S.

1/1

USSR

UDC 517.925.14;517.929

AZBELEV, N. V.

"Zero Solutions of a Second-Order Linear Differential Equation with Delayed Argument"

Minsk, Differentsial'nyye Uravneniya, No. 7, vol. 7, July 1971, pp 1147-1157

Abstract: This article finds the conditions under which the theorems of Sturm and de La Vallée-Poussin apply to equations with delayed argument. These theorems are often the means through which investigations of differential equations yield results. The first of these theorems deals with the separation of zero solutions; the second deals with the differential inequality which permits the length of the non-oscillation space -- the distance between adjacent zeros of the solution -- to be estimated. Where a delayed argument is concerned, generally speaking, these simple theorems are no longer reliable. The author bases his analysis on a consideration of the equation

USSR

AZBELEV, N. V., Differentsial'nvye Uravneniva, No. 7, vol. 7, July 1971, pp 1147-1157

$$L[x] \equiv x''(t) + \sum_{i=1}^{m} p_i(t)x(h_i(t)) = 0, \quad t \in [0,\infty),$$

$$x(\xi) = 0 \text{ if } \xi < 0$$

under the assumptions that the $p_i(t)$ can be summed for each $[\nu,\mu] \subset [0,\infty)$; $h_i(t)$ is measurable in $[0,\infty)$; $p_i(t) \geq 0$, $h_i(t) \leq t$ for almost all $t > 0$ ($i = 1, \ldots, m$), where the solution of the equation is a function $x(t)$ with an absolutely continuous derivative that satisfies the equation practically everywhere in $[0,\infty)$. The author is associated with the Tambov Institute of Chemical Machine Construction.

2/2

USSR UDC: 621.396.6.017.72(088.8)

PEL'TSMAN, I. D., NEZHINSKIY, T. I., KHASPEKOVA, Ya. N., AZBIL', Z. A.

"A Drying Installation for Radio Components"

USSR Author's Certificate No 267488, filed 3 Oct 66, published 27 Jul 70 (from RZh-Radiotekhnika, No 1, Jan 71, Abstract No 1V232 P)

Translation: This Author's Certificate introduces a drying installation for radio components such as microelements which have a flat base. The installation contains a rotating disc for moving the components from a batching device to the unloading port, and an infrared heater. To improve drying quality and simplify the design, the heater is made in the form of a flat plate located over the disc, and the disc is equipped with radial chutes so that the components can be moved one step by rakes when the chutes match up with the loading device and the unloading port. On the lateral cylindrical surface of the disc between the grooves are drive pins coupled to a mechanism for turning a system of levers and springs to turn the disc by steps and fix its position.

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Corrosion

USSR UDC 669.265'24.018.44:620.196

AZBUKIN, V. G., GORBAKON', A. A., PARSHIN, A. M.

"Increasing the High-Temperature Strength and Resistance to Intercrystalline Corrosion of Kh20N45 Alloys"

V sb Metallovedeniye (Physical Metallurgy -- collection of works), No 15, Leningrad, Sudostroyeniye Press, 1971, pp 92-100 (from Rzh-Metallurgiya, No 4, Apr 72, Abstract 4I730)

Translation: The properties of the Kh20N45 alloy mastered by industry are analyzed from the point of view of the suitability of using this alloy in thermal power engineering. It was demonstrated that this alloy, which has high resistance to chloride stress-corrosion cracking, has comparatively low-temperature strength and extremely unstable resistance to corrosion. A study was made of the effect of stabilizing additions of Ti and Nb and of the conditions of austenitizing and additional provocation heating in the 500-850° range on the stress-rupture strength. The possibility of increasing the high-temperature strength (stress-rupture strength and deformation capacity) of alloys of this type by additional alloying with molybdenum and their resistance to corrosion by limiting the C content and increasing the Nb content (Nb:C $\geq$ 24) is demonstrated. Three illustrations, four tables, and an 18-entry bibliography.

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USSR

UDC 582.285.2:634.746.(571.6)

AZBUKINA, Z. M.

"Rust Fungi That Develop Aecia on Far Eastern Species of the Berberidaceae"

Leningrad, Mikologiya i Fitopatologiya, No 5,1971, pp 420-425

Abstract: Two groups of rust fungi on species of the barberry family, Berberis amurense and Caulophyllum robustum, are described. The first group includes species with telia invariably concealed under the epidermis and teleospores with very short stems, Puccinia brachypodii Otth and Puccinia niels. The second group includes species in which the epidermis tears over the telia and the teleospores rest on more or less short stems, Puccinia graminis Pers. and Puccinia culmicola Diet. P. culmicola is found only in East Asia, while the other three species occur throughout the temperate zone of the Northern Hemisphere. The synonymy of the species and intraspecies taxa and their nomenclature are given in accordance with the rules of the International Codex of Botanical Nomenclature. The keys are arranged to assist in identifying the fungi in the haploid and diploid stages.

1/1

UDC 632.95

USSR

AZERBAYEV, I. N., AYTKHOZHAYEVA, M. Zh., TSOY, L. A.

"Acetylene-Containing Ureas"

Alma-Ata, Khimiya atsetilena i tekhnol. karbida kal'tsiya -- sbornik (Chemistry of Acetylene and Technology of Calcium Carbide -- collection of works), "Kazakhstan," 1972, pp 157-160 (from RZh-Khimiya, No 9, May 73, abstract No 9N534 by M. G. Kaplun)

Translation: Substances of the formulas $H_2NCONHC(R)(R')C{\equiv}CH$ (I) and m-$XC_6H_4NHCONHC(R)(R')C{\equiv}CH$ (II) (R and R' = alkyls or RR' = cycloalkyl, X = H or Cl) are synthesized in reactions of acetylene amines with nitrourea (III), with PhNCO, or with m-ClC_6H_4NCO. Example. 0.01 mole of $Me_2C(NH_2)C{\equiv}CH$ (IV) is added to 0.01 mole of III in 4 ml of distilled water at about 20°C, mixed for 30 minutes at the same temperature, and then at 50-55°C until gases are no longer given off, and then filtered. The filtrate is evaporated to 1/4 original volume, cooled, the precipitate is separated and crystallized from water and then from heptane. 1.09 grams of I (R = R' = Me) are obtained, $C_6H_{10}N_2O$, yield 70.7%, melting point 151°C. The following compounds of type I are synthesized by analogous methods (given are R, R' or RR', molecular formula, yield in % and melting point

USSR

AZERBAYEV, I. N., et al., Khimiya atsetilena i tekhnol. karbida kal'tsiya -- sbornik, "Kazakhstan," 1972, pp 157-160

in °C): Me, Et, $C_7H_{12}N_2O$, 77.2 103; Me, Pr, $C_8H_{14}N_2O$, 89.7, 64; cyclo-C_6H_{11}, $C_{10}H_{15}N_2O$, 90.4, 129. 0.01 mole of PhNCO is gradually added with cooling to 0.01 mole of IV in 3 ml of absolute C_6H_6. The mixture is held for 40 minutes at 40-50°C, cooled, and evaporated until dry on the following day. The residue is doubly crystallized from heptane giving 1.72 g of II (R = R' = Me, X = H), $C_{12}H_{14}N_2O$, yield 85.1%, melting point 153°C. The following compounds of type II are synthesized by analogous methods (given are R, R' or RR', X, molecular formula, yield in %, melting point in °C): Me, Et, H, $C_{13}H_{16}N_2O$, 86.1, 111; Me, Pr, H, $C_{14}H_{18}N_2O$, 99.6, 104; cyclo-C_6H_{11}, H, $C_{16}H_{19}N_2O$, 95.3, 151; Me, Me, Cl, $C_{12}H_{13}ClN_2O$, 93.2, 144; Me, Et, Cl, $C_{13}H_{15}ClN_2O$, 95.8, 123; Me, Pr, Cl, $C_{14}H_{17}ClN_2O$, 99.8, 91; cyclo-C_6H_{11}, Cl, $C_{16}H_{18}ClN_2O$, 98, 1, 133. The structure of the synthesized compounds I and II is confirmed by the data of IR spectra. The compounds were produced in a search for mutagens, herbicides and soil sterilizers.

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USSR UDC 547.241

AZERBAYEV, I. N., DZHAYLAUOV, Yu. G., BOSYAKOV, K. B., YERZHANOV, K. B., SERIKBAYEV, K. S., and ALEKSEYEVA, N. N., Institute of Chemical Sciences, Acad. Sc., KazSSR, Alma-Ata

"Reactions of Unsaturated Phosphites With Aldehydes and Ketones"

Alma-Ata, Izvestiya Akademii Nauk Kazakhskoy SSR, Seriya Khimicheskaya No 1, Jan-Feb 73, pp 51-57

Abstract: Condensation of dipropargyl phosphite with chloral and bromal yields 0,0-dipropargyl (1-hydroxy-2,2,2-trichloroethyl)phosphonate and its tribromo analog even without any catalyst. In the presence of sodium alkoxide the reaction of diallyl phosphate with 2,5-dimethylpiperidone-4, 2,6-diphenyl-piperidone-4, 2,6-di(2-hydroxyphenyl)-piperidone-4, 1,2,5-trimethylpiperidone--4 yields the respective 4-diallylphosphanepiperidoles-4; with 2,2-dimethyl-tetrahydropyranone-4, 2,2-dimethyltetrahydrothiopyranone-4 and 2,5-dimethyl-tetrahydrothiopyranone-4 the products are the respective 4-diallylphosphane-tetrahydropyranols-4. The esters of α-hydroxyphosphinic acids of pyrone, and thiopyrone series are unstable, decomposing on distillation.

1/1

USSR

UDC 547.341.26'118.07

ZARIPOV, R. K., AZERBAYEV, I. N., and AYMAKOV, U. A., Chemical-Metallurgical Institute, Academy of Sciences, KazakhSSR

"Reaction of the Esters of Hydroxymethylphosphonic Acid With Orthoformate Esters"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 4, Apr 73, pp 764-765

Abstract: A mixture of 29.6 g triethylorthoformate and 44.8 g di-n-butyl ester of hydroxymethylphosphinic acid was heated in an oil bath to 130° for 30-35 min distilling over about 12 ml of ethyl alcohol. The residue was vacuum distilled yielding di-n-butyl ester of diethoxymethyl(hydroxymethyl)-phosphinic acid. A series of homologues was obtained in an analogous manner. The products are colorless volatile liquids without a marked odor, soluble in organic solvents.

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USSR UDC: 547.241+547.653

KAMAY, G. Kh., KHASANOV, A. S., AZERBAYEV, I. N., GABDULLINA, N. Z.,
Institute of Chemical Sciences, Academy of Sciences of the Kazakh SSR

"Products of the Reaction of Chloral With Dialkyl Naphthyl Phosphites"

Leningrad, Zhurnal Obshchey Khimii, Vol 42(104), No 6, Jun 72, pp 1300-1302

Abstract: Continuing their work on the synthesis of dialkyl naphthyl phosphites, the authors studied the reaction of dialkyl α-naphthyl and dialkyl β-naphthyl phosphites with chloral and studied the physiological activity of the resultant compounds. Chloral was added slowly to an ether solution of the phosphite. The reactions yielded alkyl naphthyl β,β'-dichlorovinyl phosphates and the corresponding alkyl chlorides

$$C_{10}H_7OP(OR)_2 + Cl_3CCHO \longrightarrow C_{10}H_7OP(O)(OR)OCH{=}CCl_2 + RCl$$

The resultant products are colorless liquids which gradually hydrolyze in air. All the compounds are excellent insecticides with comparatively low toxicity for warm-blooded animals. Because of their low toxic properties and their curative effect in treatment of hypodermatosis of cattle, alkyl naphthyl β,β'-dichlorovinyl phosphates show promise for use in veterinary practice.

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USSR UDC 547.25'541.64:632.953

KOCHKIN, D. A., VORONKOV, N. A., VORONKOV, V. A., and AZERBAYEV, I. N.,
Institute of Physical Chemistry, Academy of Sciences USSR, Moscow, and
Institute of Chemical Sciences, Academy of Sciences KazSSR, Alma-Ata

"Biologically Stable Grafted Copolymers of Perchlorovinyl Resin and Organotin Acrylates and Formation of Films Based on Them"

Alma-Ata, Izvestiya Akademii Nauk KazSSR, Seriya Khimicheskaya, No 1, Jan-feb 72, pp 78-80

Abstract: Copolymers of trialkylmetacryloxystannates with perchlorovinyl (PCV) resin were obtained by heating the components in a mixture of acetone, toluene, butyl acetate, in presence of isobisnitrylisobutyric acid. These copolymers provide strong protective coverings with high antifungal activity. Optimal tensile strength, heat conductivity and temperature conductivity were obtained with 1% content of organotin metacrylates. PCV films modified with 1-2% organotin additives showed improved physico-mechanical properties and higher heat stability. The new copolymers were tested on: Chaetomium globosum, Stachybotrys atra, Aspergillus niger, Aspergillus amstelodamy, Pecylomyces variety, Penicillium cyclopium, Penicillium brevicompactum. None of these cultures showed any growth on samples protected by experimental copolymer films.

1/1

UDC 542.91:547.824

USSR

AZERBAYEV, I. N., ESKAIROV, M. E., and KUATBEKOV, A. M.

"The Synthesis of Cyanoethyl Ethers of N-Alkyl-2,6-diphenyl-4-ethylpiperidin-4-one"

Izvestiya Akademii Nauk Kazakhskoy SSR, Seriya Khimicheskaya, No 2, Mar-Apr 71, pp 68-70

Abstract: The addition of acrylonitrile to ethylpiperidones takes place in 40% aqueous potassium hydroxide. Acrylonitrile adds to the hydroxyl group to form β-cyanoethyl ethers of 1-alkyl-2,6-diphenyl-4-ethylpiperidin-4-one.

The condensation of freshly distilled acrylonitrile, in the presence of stannic chloride, with 2,6-diphenylpiperidin-4-one and 2,6-diphenyl-4-ethylpiperidine-4-one yields 1-β-cyanoethyl-2,6-diphenylpiperidine-4-one and 1-β-cyanoethyl-2,6-diphenyl-4-ethylpiperidin-4-one.

The structures of the compounds were confirmed by infrared spectroscopy.

The products were separated and identified by thin layer chromatography.

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Acc. Nr. AP0041521 Abstracting Service: CHEMICAL ABST 4/70 Ref. Code UR 0366

89995k Products of the reaction of α-chloro-α-isonitrosoacetone with aromatic amines. Azerbaev, I. N.; Kurmangalieva, R. G.; Poplavskaya, I. A. (Inst. Khim. Nauk, Alma-Ata, USSR). *Zh. Org. Khim.* 1970, 6(1), 66–8 (Russ). The reaction of $MeCOCCl{:}NOH$ (I) with RNH_2 (R is 3-MeC_6H_4, 2,4-$Me_2C_6H_3$, 2,3-Me, ClC_6H_3, 4-$MeOC_6H_4$, 2-$MeOC_6H_4$, 2-$EtOC_6H_4$, 2-MeC_6H_4, 3-HOC_6H_4, or 3-$H_2NC_6H_4$) in the presence of NEt_3 gave $MeCOC(:NOH)NHR$ (II). Similarly, treating I with α-aminopyridine in pyridine soln. gave 10–13% α-(2-pyridylamino)-α-isonitrosoacetone (III). The reaction of II with NH_2OH gave $MeC(:NOH)C(:NOH)NHR$ (IV); IV (R = 4-ClC_6H_4) was prepd. by treating $MeC(:NOH)C(:NOH)Cl$ with 4-$ClC_6H_4NH_2$ in the presence of NEt_3; III does not react with NH_2OH. CPJR

REEL/FRAME

19751389

1/2 009 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--PREPARATION OF PARTIALLY SULFONATED POLYSTYRENE -U-

AUTHOR-(02)-AZERBAYEV, I.N., ROMANOVA, D.M.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK KAZ. SSR, SER. KHIM. 1970, 20(2), 80-3

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY, MATERIALS

TOPIC TAGS--POLYSTYRENE RESIN, CHLOROFORM, SULFONATION, SOLUBILITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1999/1863 STEP NO--UR/0360/70/020/002/0080/0083

CIRC ACCESSION NO--AP0123651

UNCLASSIFIED

2/2 009 UNCLASSIFIED PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0123651

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. BLOCK POLYSTYRENE (I) WAS DISSOLVED IN CHCL SUB3 AND REACTED WITH 0.2-3.0 PARTS HSO SUB3 CL AT 20 OR 50DEGREES. THE PRODUCTS WERE PPTD. WITH C SU87 H SUB16. THE INCREASE IN HSO SUB3 CL,I RATIO GAVE PRODUCTS WITH HIGHER ACID NOS. AND LOWER SOLY. IN ORG. SOLVENTS. THE PRODUCTS OBTAINED AT 50DEGREES WITH 0.8-3:1 HSO SUB3 CL,I RATIOS WERE ONLY PARTLY SOL. IN HCONME SUB2 AND SWELLED IN MEOH. FACILITY: INST. KHIM. NAUK, ALMA-ATA, USSR.

UNCLASSIFIED

1/2 009 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--SYNTHESIS OF HETEROCYCLIC ACETYLENIC ALPHA, ALPHA PRIME, AND GAMMA TRIOLS -U-

AUTHOR-(03)-AZERBAYEV, I.N., KUSAINOVA, ZH.ZH., YERZHANOV, K.B.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK KAZ. SSR, SER. KHIM. 1970, 20(1), 81-4

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--CONDENSATION REACTION, KETONE, ACETYLENE, HETEROCYCLIC NITROGEN COMPOUND, ALCOHOL, CHEMICAL SYNTHESIS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1997/0622 STEP NO--UR/0360/70/020/001/0081/0084

CIRC ACCESSION NO--AP0119534

UNCLASSIFIED

2/2 009 UNCLASSIFIED PROCESSING DATE--30OCT70
CIRC ACCESSION NO--AP0119534
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE TITLE COMPOS. WERE PREPD. EITHER BY CONDENSATION OF KETONES (SUCH AS SUBSTITUTED PIPERIDONES) WITH HEXYNEDIOL, OR BY CONDENSATION OF 4,HYDROXY,4,ETHYNYLPIPERIDONES WITH BETA KETOLS. THUS, 12.6 G 2,6,DIPHENYL,4,PIPERIDONE AND 12.8 G 3,METHYL,1,HEXYNE,3,5,DIOL (I) IN 100 ML TETRAHYDROFURAN (II) WAS ADDED AT 0-2DEGREES TO 16.8 G KOH AND 150 ML II TO GIVE 52PERCENT 2,6,DIPHENYL,4,(3,METHYL,3,5,DIHYDROXYHEXYNYL),4,PIPERIDINOL (III), M. 117-18DEGREES (LIGROINE); HYDROCHLORIDE M. 262-4DEGREES. SIMILARLY, 56PERCENT, 2,2,5,TRIMETHYL,4,(3,METHYL, 3,5,DIHYDROXYHEXYL),4,PIPERIDINOL, M. 132-3DEGREES (LIGROINE) (HYDROCHLORIDE M. 160-1DEGREES) WAS PREPD. FROM 5.7 G 2,2,5,TRIMETHYL,4,PIPERIDONE AND 7.6 G I. ETMGBR (FROM 1.93 G MG AND 8.75 G ETBR IN 100 ML II) WAS TREATED WITH 6.68 G BETA ISOMER OF 1,2,5,TRIMETHYL,4,HEXYNYL,4,PIPERIDINOL IN 50 ML II AND 4.1 G 2,OXO,4,PENTANOL IN 20 ML II TO GIVE 35PERCENT 1,2,5,TRIMETHYL,4,(3, METHYL,3,5,DIHYDROXYHEXYNYL),4,PIPERIDINOL M. 139-40DEGREES; HYDROCHLORIDE M. 227-8DEGREES. SIMILARLY, 63.2PERCENT 2,2,DIMETHYL,4,(3,METHYL,3,5,DIHYDROXYHEXYNYL), 4,TETRAHYDROPYRANOL M. 78-9DEGREES WAS OBTAINED FROM 6.15 G 2,2,DIMETHYL,4,ETHYNYL,4,TETRAHYDROPYRANOL AND 4.1 G III.
FACILITY: INST. KHIM. NAUK, ALMA-ATA, USSR.

UNCLASSIFIED

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002200220017-5"

USSR UDC 547.241+547.362+547.81+547.823

AZERBAYEV, I. N., DZHAYLAUOV, S. D., BOSYAKOV, Yu. G., YERZHANOV, K. B., and SERIKBAYEV, K. S., Institute of Chemical Sciences, Academy of Sciences KazakhSSR

"Reaction of Dipropargylphosphorous Acid With Heterocyclic Ketones"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 2, Feb 73, pp 288-292

Abstract: Reaction of dipropargylphosphorous acid with β-ketones of the pyran, thiopyran, and piperidine series in presence of sodium alkoxide leads to the formation of respective dipropargyl esters of heterocyclic α-hydroxyphosphonic acids. It was shown that nucleophilic addition of dipropargyl phosphite to pyranone and thiopyranones, in contrast to piperidones, requires the presence of alkaline catalysts. It is assumed that the aminoketone acts as a catalyst.

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USSR

UDC 632.95

KHASANOV, A. S., TSAREV, S. G., KAMAY, G. Kh., AZERBAYEV, I. N., GABDULLINA, N. Z.

"Synthesis of New Chloral-Based Organophosphorus Insecticides"

Alma-Ata, Khimiya atsetilena i tekhnol. karbida kal'tsiya--sbornik (Chemistry of Acetylene and Technology of Calcium Carbide--collection of works), "Kazakhstan," 1972, pp 359-361 (from RZh-Khimiya, No 9, May 73, abstract No 9N476 by T. Ya. Ogibina)

Translation: Agricultural insecticides are synthesized -- ethyl α-naphthyl β,β-dichlorovinyl phosphate (I) and ethyl β-naphthyl β,β'-dichlorovinyl phosphate (II). Example. 0.228 mole of Cl_3CCHO diluted by an equal volume of ether is gradually added with agitation and cooling to -10°C to an ether solution of 0.228 mole of diethyl α-naphthyl phosphite. The mixture is kept for 1 hour at ~20°C, the ether is driven off, the residue is distilled twice under vacuum giving compound I with a yield of 68% $C_{14}H_{13}Cl_2O_4P$, boiling point 150-1°/0.12, d_4^{20} 1.3370, $n^{20}D$ 1.5648. In a similar procedure compound II is produced with a yield of 73.3% $C_{14}H_{13}Cl_2O_4P$, boiling point 161-3°/0.1, d_4^{20} 1.3395, $n^{20}D$ 1.5030. Compounds I and II are insoluble in water, and dissolve readily in ether, acetone and other organic solvents.

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USSR

KHASANOV, A. S., et al., Khimiya atsetilena i tekhnol. karbida kal'tsiya -- sbornik, "Kazakhstan," 1972, pp 359-361

The insecticidal and toxic properties of the chemicals were studied as well as their myotic and anticholinesterase effect and their curative action when hypodermically injected in cattle. It is shown that the toxicity of I for warm-blooded animals is 1.5 times less than that of chlorophos, while that of II is two times less, while the larvicidal effect on midge larvae is ten times greater than that of chlorophos. The curative action of I in hypodermic injection of cattle was studied in 1.5 and 3% concentrations. The preparation was used externally in the form of an emulsion with OP-7 in a dose of 200 ml. The animals were treated in March. Compound II in this method of injection is used only in the form of a 3% emulsion with OP-7. Observations showed that I is 100% lethal and II is 98% lethal for ox bot larvae.

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USSR

AZERVAYEV, I. N., AITKHOZHAYEVA, M. ZH., TSOY, L. A.

"Method of Producing Mono-or Disubstituted Urea"

USSR Author's Certificate No 281454, field 28/07/69, published 19/03/71. (Translated from Referativnyy Zhurnal Khimiya, No 4, Moscow, 1972, Abstract No 4N592P by T. A. Belyaeva).

Translation: Substituted ureas with the general formula RNHC(O)NHCR'-R"C=CH(I) (R=H, Ph, C_6H_4Cl; R' and R" = lower alkyl or CR'R"=cyclical radical) are produced by reacting nitrourea (II) or RNCO (III) with substituted acetylene amine. 0.01 mol $Me_2C(NH_2)C{=}CH$ (IV) is added to a solution of 0.01 mol II in 4 ml water at about 20°, agitated 30 minutes at about 20°, then at 50-55° until gas bubbles stop evolving, filtered, evaporated in a vacuum and I (R=H, R'=R"=Me), is separated, yield 70.7%, mp 151° (from water). Similarly, I is produced (R=H) (given are R', R", yield in %, mp in °C): Me, Et, 77.2, 109; Me, Pr, 89.7, 64. Also produced is I [R=H, R'R"C=cyclohexylidiene (CHD)], yield 90.4%, mp 129°. 1.1 g III (R=Ph) is added to a solution of 0.88 g IV in 3 ml C_6H_6 with cooling, heated 40 minutes to 40-50°, cooled, evaporated and I is separated (R'=R"=Me, R=Ph), yield 85.1%, mp 153° (heptane). A similar process produces I (given are R, R', R", yield in %, mp in °C: Ph, Me, Et, 86.1, 111; Ph, Me, Pr, 99.6, 104; m-ClC_6H_4, Me, Me, 93.2, 144; m-ClC_6H_4, Me, Et, 95.8, 123; m-ClC_6H_4, Me, Pr, 99.8, 91; Ph, R'R"C=CHD, 95.3, 151; m-ClC_6H_4, R'R"C=CHD 98.1, 133.

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Acc. Nr: AP0042297 A

Ref. Code: UR 0422

PRIMARY SOURCE: Standarty i Kachestvo, 1970, Nr 1, pp37-40

Major Problems of Qualimetry.

Azgal'dov, G. G.; Raykhman, E. P.

The authors single out a number of the most important theoretical problems of qualimetry, arranged in the order of their appearance in the solution of practical problems of estimating the quality of whatever objects.

MT

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REEL/FRAME
19760235

1/2 010 UNCLASSIFIED PROCESSING DATE--18SEP70
TITLE--CRITERIA OF OUTDATING -U-

AUTHOR--AZGALDOV, G.G.

COUNTRY OF INFO--USSR

SOURCE--STANDARTY I KACHESTVO, 1970, NR 2, PP 67-69

DATE PUBLISHED--------70

SUBJECT AREAS--BEHAVIORAL AND SOCIAL SCIENCES

TOPIC TAGS--QUALITY CONTROL, INDUSTRIAL STANDARD, INDUSTRIAL MANAGEMENT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1984/2027 STEP NO--UR/0422/70/000/002/0067/0069

CIRC ACCESSION NO--AP0100592
UNCLASSIFIED

2/2 010 UNCLASSIFIED PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0100592

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE QUANTITATIVE METHOD OF ASSESSMENT OF THE CRITERION OF OUTDATING, SUGGESTED IN THE ARTICLE, IS FOUNDED ON A COMPARISON OF THE USE VALUE WITH THE TOTAL EXPENSES. A BRIEF CRITICAL REVIEW OF LITERATURE ON THE SUBJECT IS PRESENTED.

UNCLASSIFIED

USSR

ADILOV, D. A. and AZGAMOV, B. M., Uzbek Scientific Research Institute of Epidemiology, Microbiology, and Infectious Diseases

"Clinical Picture of Anthrax in Recent Years"

Tashkent, Meditsinskiy Zhurnal Uzbekistana, No 9, 1972, pp 55-57

Abstract: Study of the case histories of 444 anthrax patients from 1938 to 1970 showed that the course of the skin form of the disease became more benign after 1950. The number of severe cases and the mortality rate declined sharply mainly because of the widespread use of sulfa drugs and antibiotics. Carbuncles appeared more often on the hands than on the face, possibly owing to change in the mode of transmission of the infection. The temperature reaction occurred in about three-fourths of the patients, or at about the same rate as in the past, but its intensity was less and the duration shorter due to early administration of antianthrax globulin combined with antibiotics.

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USSR UDC 612.5-087.86

LOGUNOV, A. D., AZHAYEV, A. N., and KOSHELEVA, O. S.

"Determination of the Coefficients of Mixing for Calculation of the Average Temperature of the Human Body"

Moscow, Gigiyena i Sanitariya, No 3, Mar 73, pp 72-75

Abstract: In experiments on humans placed for 1-6 hrs into a chamber with an air temperature of -40, -10, 5, 25, 30, 35, or 40°, the heat flow between the body and the surrounding air, the temperature of the skin, and the rectal temperature were determined. The subjects on whom the experiments were carried out were nude or dressed in summer, winter, or between-season clothing. On the basis of the experimental data obtained, formulas for the coefficients of mixing corresponding to the temperature of the skin and the rectal temperature under various conditions of heat exchange were derived. Nomographs were plotted which indicate 1) the relation between the coefficient of mixing for the skin temperature and the thermal insulation of body tissues; 2) the relation between the insulation of body tissues and the inner temperature gradient of the body; 3) the relation between the coefficients of mixing for the rectal and skin temperatures and the rectal-skin temperature gradients and also between these coefficients and the

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USSR

LOGUNOV, A. D., et al., Gigiyena i Sanitariya, No 3, Mar 73, pp 72-75

thermal insulation of the body tissues. With an increasing difference between the rectal and median skin temperature, the degree of thermal insulation of the body tissues increased, while decreasing with a reduction of the inner temperature gradient. At low outside temperatures the thermal insulation of the body surface increased. It decreased at high outside temperatures.

USSR

UDC 612.57

AZHAYEV, A. N., Moscow

"Special Aspects of Heat Metabolism in Man at High Ambient Temperatures"

Leningrad, Fiziologicheskiy Zhurnal SSSR imeni I. M. Sechenova, Vol 58, No 3, 1972, pp 463-468

Abstract: On the basis of measurements performed on human subjects resting in a thermal chamber at air temperatures ranging from 40 to 80°C and a low relative humidity (10-25%) for up to 60 min., physiological reactions associated with heat metabolism are divided into three stages of hyperthermia. In the first stage, body temperature rises slightly from 36.9 (control) to 37.3°C, heat production decreases from 1.47 to 1.29 Cal/min, thermal insulation by the skin falls from 0.3 to 0.12 units, heart rate increases from 69 to 79 beats/min, arterial pressure is maintained, and the total accumulation of heat is 12.1 Cal/m^2 of body surface; thus, the body successfully copes with the high ambient temperature. In the second stage, heat loss lags behind heat production so that a large quantity of heat is accumulated (54.8 Cal/m^2) and body temperature rises to 38.8°C; however, the cardiovascular system is functioning efficiently. In the third stage of hyperthermia (body temperature 39.4°C), circulatory decompensation begins, and a heat stroke becomes iminent.

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1/2 012 UNCLASSIFIED PROCESSING DATE--02OCT70
TITLE--OCEANIC DEPTHS -U-

AUTHOR--AZHAZHA, V.

COUNTRY OF INFO--USSR

SOURCE--VODNYY TRANSPORT, MAY 30, 1970, P 3, COLS 1-4

DATE PUBLISHED--30MAY70

SUBJECT AREAS--MECH., IND., CIVIL AND MARINE ENGR, EARTH SCIENCES AND OCEANOGRAPHY
TOPIC TAGS--SUBMARINE, UNDERWATER RESEARCH LABORATORY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1989/0990 STEP NO--UR/9028/70/000/000/0003/0003

CIRC ACCESSION NO--AN0107511
UNCLASSIFIED

2/2 012 UNCLASSIFIED PROCESSING DATE--020CT70
CIRC ACCESSION NO--AN0107511
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ARTICLE BRIEFLY REVIEWS THE SOVIET UNDERWATER RESEARCH BY SUBMARINES BETWEEN 1908 AND 1958.

UNCLASSIFIED

USSR UDC 546.882+620.172.24

AMONENKO, V. M., AZHAZHA, V. M., ZEYDLITS, M. P., and SHEVCHENKO, S. V., Physical-Mechanical Institute, Academy of Sciences Ukrainian SSR

"Effect of Small Additions of Oxygen and Nitrogen on the Nature of the Mechanical Properties-Temperature Relationship in Niobium"

Kiev, Problemy Prochnosti, No 6, 1973, pp 54-56

Abstract: The effect of oxygen and nitrogen impurities on the nature of the temperature and strength-ductility properties of niobium was studied. Niobium of 99.8% purity was used which contained metallic impurities of 0.09% Ta and $5 \cdot 10^{-3}$% W and Fe, and interstitial impurities of $2 \cdot 10^{-3}$% H_2, $5 \cdot 10^{-3}$% O_2 and $2.6 \cdot 10^{-3}$% N_2. The mechanical properties of niobium were studied in the 20-900 C interval where it was shown that at a strain rate of $1.6 \cdot 10^{-3}$ sec, at 300, 400 and 550 C, maximum strength properties and minimum ductility are observed. Height of the maximums at 300 and 550 C depends on the concentration of oxygen and nitrogen. The smooth change in the mechanical properties of niobium with temperature is associated with the deformation dynamics of aging. 3 figures, 1 table, 9 bibliographic references.

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AZHAZHA, V. M.

(4)

Selected Translations of Metallurgy, JPRS 58671, 30 March 1973 — Fizika Metallov i Metallovedeniye Vol. 34, # 6, 1972

UDC 539.374

FEATURES OF THE STRUCTURE AND PLASTIC DEFORMATION OF ZIRCONIUM SATURATED BY NITROGEN AND OXYGEN

V. M. Azhazha, P. V. V'yugov, L. N. Ryabchikov, and V. A. Finkel', Physics Engineering Institute of the Ukrainian SSR Academy of Sciences,
submitted to press 1 February 1972 pages 1298-1300

The purpose of this work is the study of the effect of the saturation with nitrogen and oxygen at low pressure on the mechanical properties, features of plastic deformation, and structure of zirconium iodide and a purer metal obtained by the zone smelting method [1].

Specimens with the given content of gaseous impurities were prepared by saturation of the zirconium bands with a thickness of 0.3 millimeter, heated by alternating current in a vacuum chamber, as a result of the feeding of nitrogen or oxygen through a measuring valve. The temperature of the specimens was 1200°Centigrade, the saturation time 2 minutes, the pressure of the gases 10^{-5}--10^{-4} torr. The quantity of gas absorbed was calculated according to data concerning the rate of absorption [2] and was controlled by chemical analyses. After saturation by gases, the zirconium ribbons were annealed for the purpose of homogenization for 8 minutes, at the same temperature in a vacuum of 1×10^{-6} torr.

The mechanical properties were studied at room temperature on specimens with dimensions of the working part of 20 x 50 x 0.3 millimeter at a constant rate of tension 1.6×10^{-3} $seconds^{-1}$. The load was measured by the DF-0.2 specimen dynamometer.

For the study of the crystal structure of zirconium, a methodology developed earlier for obtaining specimens with a temperature gradient was used [3]: a shaped specimen was heated by alternating electric current, and in this case a temperature difference from 700 to 1400°C was created

in it. Because of the different rate of absorption, the concentration of nitrogen or oxygen varied along the length of the specimen; aside from this, the section of the specimen found at a temperature above 865°C underwent a $\beta \rightarrow \alpha$ phase transformation (OTsK--GPU), while the other part was in the α-phase all the time.

X-ray photographs of the sections of the specimen corresponding to various saturation temperatures were taken in a Debye chamber with a diameter of 114 millimeters in CuKα -radiation. For precision measurement of the parameters of the lattices, the zirconium was subjected to x-ray photography according to the reverse photography method, and reflections from planes (211), (114) and (213) of the GPU lattice were fixed in the CuKα -radiation.

On x-ray photographs of zirconium saturated with nitrogen to a concentration of 0.07% with respect to mass, only α-Zr lines were observed; at a high content of nitrogen on the x-ray photographs of specimens cooled from a temperature higher than 900°C, a splitting of certain diffraction lines occurred. The nature of the splitting of the hexagonal reflexes indicates the fact that in these conditions, instead of an ordinary $\beta \rightarrow \alpha$ transformation (OTsK--GPU) a $\beta \rightarrow \alpha'$ transformation (OTsK--Rhomboid) occurs.

Figure 1. Parameters of the crystal lattice of zirconium saturated with nitrogen at a pressure of 6×10^{-4} torr as a function of the annealing temperature.

USSR UDC 621.79.027

AMONENKO, V. M., AZHAZHA, V. M., V'YUGOV, P. N., GUMENYUK, V. S., and SIVOKON', V. V.

"The Possibility of Purification of Chemically Active Metals by Zone Melting"

Monokristally Tugoplavkikh i Redkikh Metallov [Single Crystals of Refractory and Rare Metals -- Collection of Works], Nauka Press, 1971, pp 5-12

Translation: An installation is described for zone cathode ray melting of zirconium with a residual pressure of ~$5 \cdot 10^{-8}$ torr. The heating chamber, sealed with metal, is evacuated with two oil-vapor pumps with sorption traps. Data are presented on the partial pressures of residual gases and their changes as functions of the duration of operation of the installations with the sorption traps. It is demonstrated that the use of the new 5F-4E vacuum oil as a working fluid in the oil-vapor pumps is promising for the production of vacuums of ~$4 \cdot 10^{-6}$ in metallurgical pipe installations. Data are presented on zone purification of zirconium in a vacuum of $7 \cdot 10^{-8}$-$1 \cdot 10^{-7}$ torr. 5 Tables; 6 Figures; 2 Bibliographic references.

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USSR A UDC 621.79

AZHAZHA, V. M., ANOKHENKO, V. M., KOVTUN, G. P., RYBAL'CHENKO, N. D.

"Effect of Titanium Coatings on the Plasticity of Molybdenum"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 3, May-Jun 70, pp 59-62

Abstract: Titanium coatings cause a change in the plasticity of molybdenum. The nature and degree of the effect of the coatings depend on the thickness of the coating, the annealing conditions, and other factors. Titanium films up to 1 micron thick cause an increase in the elongation per unit length of molybdenum after annealing in the temperature range of 450-1100°C. Films 10 microns thick and more increase the plasticity of molybdenum if the annealing temperature after coating does not exceed 700°C, and they cause embrittlement after annealing above 800°C. The mechanism of the effect of titanium coatings on the plastic properties of molybdenum is discussed. Additional data are given on the effect of titanium coatings on the plastic properties of molybdenum and on the causes of the plasticizing and embrittling effect of titanium coatings.

Microphotographs of the samples after various heat treatments are presented. It is pointed out that during the process of annealing, diffusion of titanium in the surface layers of molybdenum takes place primarily with respect to the lattice defects, in particular, along the grain boundaries. In molybdenum the grain boundaries are the most probable centers of fracture. Fracture of polycrystalline

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USSR

AZHAZHA, V. M., et al, Fizika i Khimiya Obrabotki Materialov, No 3, May-Jun 70, pp 59-62

samples of molybdenum almost always begins on the grain boundary, although propagation of the fracture can have a transcrystalline nature. The diffusion of titanium along the grain boundaries neutralizes the effect of the interstitial admixtures which usually are isolated along the grain boundaries and harden the boundaries. This decreases the probability of occurrence of centers of fracture along the grain boundaries and leads to a more uniform deformation of molybdenum. This explains the fact that the maximum elongation of the molybdenum samples is reached with a titanium film 1 micron thick after annealing in the temperature range of 1000-1100°C.

1/2 C40 UNCLASSIFIED PROCESSING DATE--20NOV70
TITLE--APPLICATION OF THE METHOD OF SECONDARY ION ION EMISSION TO THE STUDY OF PROCESSES OCCURRING DURING THE INITIAL STAGES OF TITANIUM
AUTHOR-(04)-ABRAMENKOV, A.D., AZHAZHA, V.M., FOGEL, YA.M., SHVACHKO, V.I.

A

COUNTRY OF INFO--USSR

SOURCE--FIZIKA METALLOV I METALLOVEDENIE, VOL. 29, MAR. 1970, P. 519-523

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--TITANIUM, MOLYBDENUM ALLOY, METAL VAPOR DEPOSITION, BIBLIOGRAPHY, METAL COATING, INTERMETALLIC COMPOUND, REFRACTORY METAL, METAL DIFFUSION, SPECTROGRAPHIC ANALYSIS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3001/0069 STEP NO--UR/0126/70/029/000/0519/0523

CIRC ACCESSION NO--AP0125904
UNCLASSIFIED

2/2 040 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0125904

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STUDY OF THE INITIAL STAGES IN THE FORMATION OF A VAPORIZATION COATING OF TITANIUM ON MOLYBDENUM, USING SECONDARY ION ION EMISSION AND MASS SPECTRAL ANALYSIS. IT IS DEMONSTRATED THAT DURING COATING FORMATION, MOLYBDENUM ATOMS DIFFUSE FROM THE SUBSTRATE INTO THE COATING. THESE ATOMS DO NOT FORM INTERMETALLIC COMPOUNDS WITH TITANIUM. FACILITY: AKADEMIIA NAUK UKRAINSKOI SSR, FIZIKO-TEKHNICHESKII INSTITUT, KHARLOV, UKRAINIAN SSR.

UNCLASSIFIED

1/2 043 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--INFLUENCE OF THE ZIRCONIUM ADDITIONS ON THE RELAXATION SPECTRUM OF NICKEL -U-

AUTHOR-(04)-AZHAZHA, V.M., BONDARENKO, N.P., ZEYDLITS, M.P., SHAPOVAL, B.I.

COUNTRY OF INFO--USSR

A

SOURCE--FIZIKA METALLOV I METALLOVEDENIE, VOL. 29, FEB. 1970, P. 324-328

DATE PUBLISHED----FEB70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--ZIRCONIUM CONTAINING ALLOY, NICKEL ALLOY, METAL INTERNAL FRICTION, HYDRIDE, METAL CREEP, SPECTRUM, VIBRATION DAMPING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1995/0894 STEP NO--UR/0126/70/029/000/0324/0328

CIRC ACCESSION NO--AP0116404

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2/2 043 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0116404

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STUDY OF THE EFFECT OF ZIRCONIUM ADDITIONS (UP TO 0.5PERCENT) ON THE BEHAVIOR OF INTERNAL FRICTION IN NICKEL SUBJECTED TO CREEP. IT IS FOUND THAT ZIRCONIUM CONTENTS OF 0.1 AND 0.3PERCENT INCREASE THE MAXIMA (ON THE RELAXATION SPECTRUM CURVE) THAT ARE DUE TO MAGNETOMECHANICAL DAMPING, GRAIN BOUNDARIES, AND BLOCK STRUCTURE, RESPECTIVELY. ZIRCONIUM CONTENT OF 0.5PERCENT DECREASES THESE MAXIMA. IT IS SUGGESTED THAT 0.3PERCENT ZR CORRESPONDS TO THE SOLUBILITY LIMIT OF ZR IN NI. THE PEAK DETECTED ON THE CURVE OF INTERNAL FRICTION IS SUGGESTED TO BE DUE TO THE PRECIPITATION OF ZIRCONIUM HYDRIDE. FACILITY: AKADEMIIA NAUK UKRAINSKOI SSR. FACILITY: FIZIKO TEKHNICHESKII INSTITUT, KHARKOV, UKRAINIAN SSR.

UNCLASSIFIED

1/2 037 UNCLASSIFIED PROCESSING DATE--11SEP70

TITLE--EFFECT OF ANNEALING CONDITIONS ON THE MECHANICAL PROPERTIES OF PURE NIOBIUM AND MOLYBDENUM COATED NIOBIUM -U-

AUTHOR--AMONENKO, V.M., AZHAZHA, V.M., KOVTUN, G.P.

COUNTRY OF INFO--USSR

SOURCE--FIZ. KHIM. MEKH. MATER. 1970, 5(6), 733-4

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--NIOBIUM, HIGH PURITY METAL, METAL COATING, MOLYBDENUM, METAL FILM, GAS CONTAINING METAL, VACUUM ANNEALING, METAL DEFORMATION, GRAIN SIZE, METAL RECRYSTALLIZATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1988/0622 STEP NO--UR/0369/70/005/006/0733/0735

CIRC ACCESSION NO--AP0105601

UNCLASSIFIED

2/2 037 UNCLASSIFIED PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0105601

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECT WAS STUDIED OF RESIDUAL GASES IN VACUUM ANNELAING (5 TIMES 10 PRIME NEGATIVE4 MINUS 5 TIMES 10 PRIME NEGATIVE7 TORR) AT 1000-1600DEGREES ON PURE NB. THE EFFECT OF THIN FILMS OF MO ON NB PROPERTIES AFTER ANNEALING IN VACUO WAS STUDIED ALSO. SPECIMENS (12 TIMES 2 TIMES 1 MM) WERE MADE FROM ROLLED BANDS (DEFORMATION DEGREE 80PERCENT) AND ANNEALED FOR 1 HR AT 1000-1600DEGREES. WHEN THE VACUUM WAS 5 TIMES 10 PRIME NEGATIVE7 TORR, THE TENSILE STRENGTH OF NB WAS LESS THAN THAT WHEN THE VACUUM WAS 10 PRIME NEGATIVE4 TORR; THE RELATIVE ELONGATION INCREASED. HOWEVER, ANNEALING AT IS GREATER THAN 1200DEGREES DECREASED THE RELATIVE ELONGATION, PARTICULARLY AT 10 PRIME NEGATIVE4 TORR. THESE CHANGES ARE DUE TO THE DEVELOPMENT OF PRIMARY AND SECONDARY RECRYSTN. WITH INCREASING GRAIN SIZE AT HIGHER TEMPS. INCREASED TENSILE STRENGTH AND DECREASED RELATIVE ELONGATION IS ASCRIBED TO THE INCREASED GAS CONTENT IN NB. WHEN THE NB SPECIMENS WERE COATED WITH MO, ALL THE ABOVE INDICATED EFFECTS WERE CONSIDERABLY LESS; MO IS LESS AFFECTED BY GASES THAN NB.

UNCLASSIFIED

AZHAZHA, Ye. G.

SO JPRS 50279
14 June 70

NATURE OF "SMOKY" SPOTS OCCURRING ON THE SURFACE OF SILICON ALLOYED WITH BORON AFTER CHEMICAL POLISHING

All-Union Conference Materials

[Article by Ye. G. Azhazha: Novosibirsk, Proceedings Roste i Struktura Monokristallicheskikh Sloyev Poluprovodnikov -- Trudy Simpoziuma, Russian, Part 2, 1969, pp 97-102]

With chemical polishing etching in a mixture of nitric acid, hydrofluoric acid and acetic acid of silicon substrates used for epitaxial and planar processes, an individual cause spots are observed on the surface in the form of smoke, the color of which varies from gray-brown to blue-violet (photograph No 16). In a number of publications there have been discussions of the phenomenon of such "smoky" spots on silicon and germanium as a result of chemical or electrochemical etching in various oxidizing etching agents. However, there is no united opinion regarding the nature of the spots and their effect on the subsequent processes. It is demonstrated that the cause of the spots is not the surface contamination since the spots can arise even when special measures are taken with respect to observing the surface cleanness [1]. A number of authors propose that the spots are films of impurities which have settled on the polished surface -- oxides, hydrides, fluorides of silicon (or germanium) or sediment of an elementary semiconductor in amorphous or polycrystalline form [2-4]. These propositions have not been confirmed by the studies of Andrews and Gereth, who demonstrated that the "smoke" effect arises from a specific fine structure of the specimen -- a surface of the hilly type with a height of the relief no more than 300 Å [5]. However, the authors have not established the causes for the occurrence of this uneven surface.

The practice of chemical etching of the silicon plates alloyed with phosphorous or boron has demonstrated that the "smoky" spots can appear only in the latter case and with increasing concentration of the boron the probability of their appearance increases. The spots on the KDB-0.0 to silicon were observed most frequently. On silicon alloyed with phosphorous there were no spots. The spots occur at the time of halting the pickling, especially, if the dilution of the pickling agent by water has been carried out slowly.

The spots appeared primarily in the corner in cases where the additional temperature of the etching agent Tetch was above 21° C, and the etching rate (on one side of the plate) exceeded 6 microns/minute. For a temperature of

1/2 037 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--IMPURITY STATES OF MERCURY IN GERMANIUM,SILICON ALLOYS -U-

AUTHOR-(03)-AZHDAROV, G.KH., TAGIROV, V.I., TAIROV, S.I.

COUNTRY OF INFO--USSR

A

SOURCE--FIZIKA I TEKHN. POLUPROV., APR. 1970, 4, (4), 774-776

DATE PUBLISHED----APR70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--GERMANIUM ALLOY, ELECTRICAL PROPERTY, SILICON ALLOY, METAL COATING, MERCURY, HALL EFFECT, ELECTRIC CONDUCTIVITY, LOW TEMPERATURE EFFECT, ELECTRON ACCEPTOR

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3003/0221 STEP NO--UR/0449/70/004/004/0774/0776

CIRC ACCESSION NO--AP0129477

UNCLASSIFIED

CIRC ACCESSION NO--AP0129477

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ELECTRICAL PROPERTIES (ELECTRICAL CONDUCTIVITY, HALL EFFECT, ETC.) OF HG-DOPED GE-SI ALLOYS WERE STUDIED WITH SPECIAL REF. TO THE PART PLAYED BY THE FIRST ACCEPTOR LEVEL OF HG AND ALSO POSSIBLE DONOR LEVELS. THE RISE IN THE HALL COEFF. AT LOW TEMP. (100DEGREESK) SUGGESTED THE PRESENCE OF ONE OR MORE DONOR CENTRES; ONE POSSIBILITY WAS THAT THESE GAVE THEIR ELECTRONS TO SHALLOW ACCEPTORS, WHILE THEY THEMSELVES ACTED AS PSEUDO ACCEPTOR LEVELS.

USSR

UDC 546.882+620.172.24

AMONENKO, V. M., AZHAZHA, V. M., ZEYDLITS, M. P., and SHEVCHENKO, S. V.,
Physical-Mechanical Institute, Academy of Sciences Ukrainian SSR

"Effect of Small Additions of Oxygen and Nitrogen on the Nature of the Mechanical Properties-Temperature Relationship in Niobium"

Kiev, Problemy Prochnosti, No 6, 1973, pp 54-56

Abstract: The effect of oxygen and nitrogen impurities on the nature of the temperature and strength-ductility properties of niobium was studied. Niobium of 99.8% purity was used which contained metallic impurities of 0.09% Ta and $5 \cdot 10^{-3}$% W and Fe, and interstitial impurities of $2 \cdot 10^{-3}$% H_2, $5 \cdot 10^{-3}$% O_2 and $2.6 \cdot 10^{-3}$% N_2. The mechanical properties of niobium were studied in the 20-900 C interval where it was shown that at a strain rate of $1.6 \cdot 10^{-3}$ sec, at 300, 400 and 550 C, maximum strength properties and minimum ductility are observed. Height of the maximums at 300 and 550 C depends on the concentration of oxygen and nitrogen. The smooth change in the mechanical properties of niobium with temperature is associated with the deformation dynamics of aging. 3 figures, 1 table, 9 bibliographic references.

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(4)

Selected Translations of Metallurgy, JPRS 55611, 30 March 1973 – Fizika Metallov i Metallovedeniye Vol. 34, # 6, 1972

UDC 539.374

FEATURES OF THE STRUCTURE AND PLASTIC DEFORMATION OF ZIRCONIUM SATURATED BY NITROGEN AND OXYGEN

V. M. Azhazha, P. V. V'yugov, L. N. Ryabchikov, and V. A. Finkel', Physics Engineering Institute of the Ukrainian SSR Academy of Sciences,
pages 1298-1300
submitted to press 1 February 1972

The purpose of this work is the study of the effect of the saturation with nitrogen and oxygen at low pressure on the mechanical properties, features of plastic deformation, and structure of zirconium iodide and a purer metal obtained by the zone smelting method [1].

Specimens with the given content of gaseous impurities were prepared by saturation of the zirconium bands with a thickness of 0.3 millimeter, heated by alternating current in a vacuum chamber, as a result of the feeding of nitrogen or oxygen through a measuring valve. The temperature of the specimens was 1200°Centigrade, the saturation time 2 minutes, the pressure of the gases 10^{-5}--10^{-4} torr. The quantity of gas absorbed was calculated according to data concerning the rate of absorption [2] and was controlled by chemical analyses. After saturation by gases, the zirconium ribbons were annealed for the purpose of homogenization for 8 minutes, at the same temperature in a vacuum of 1×10^{-6} torr.

The mechanical properties were studied at room temperature on specimens with dimensions of the working part of 20 x 50 x 0.3 millimeter at a constant rate of tension 1.6×10^{-3} $seconds^{-1}$. The load was measured by the DF-0.2 specimen dynamometer.

For the study of the crystal structure of zirconium, a methodology developed earlier for obtaining specimens with a temperature gradient was used [3]: a shaped specimen was heated by alternating electric current, and in this case a temperature difference from 700 to 1400°C was created

AZHAZHA, V.M.

in it. Because of the different rate of absorption, the concentration of nitrogen or oxygen varied along the length of the specimens; aside from this, the section of the specimen found at a temperature above 860°C underwent a $\beta \rightarrow \alpha$ phase transformation (OTaK--GPU), while the other part was in the α-phase all the time.

X-ray photographs of the sections of the specimen corresponding to various saturation temperatures were taken in a Debye chamber with a diameter of 114 millimeters in CuK α -radiation. For precision measurement of the parameters of the lattices, the zirconium was subjected to x-ray photography according to the reverse photography method, and reflections from planes (211), (114) and (213) of the GPU lattice were fixed in the CuK α -radiation.

On x-ray photographs of zirconium saturated with nitrogen to a concentration of 0.07% with respect to mass, only α-Zr lines were observed; at a high content of nitrogen on the x-ray photographs of specimens cooled from a temperature higher than 900°C, a splitting of certain diffraction lines occurred. The nature of the splitting of the hexagonal reflexes indicates the fact that in these conditions, instead of an ordinary $\beta \rightarrow \alpha$ transformation (OTaK--GPU) a $\beta \rightarrow \alpha'$ transformation (OTaK--Rhomboid) occurs.

Figure 1. Parameters of the crystal lattice of zirconium saturated with nitrogen at a pressure of 6 x 10-4 torr as a function of the annealing temperature.

UDC 621.79.027

USSR

AMONENKO, V. M., AZHAZHA, V. M., V'YUGOV, P. N., GUMENYUK, V. S., and SIVOKON', V. V.

"The Possibility of Purification of Chemically Active Metals by Zone Melting"

Monokristally Tugoplavkikh i Redkikh Metallov [Single Crystals of Refractory and Rare Metals -- Collection of Works], Nauka Press, 1971, pp 5-12

Translation: An installation is described for zone cathode ray melting of zirconium with a residual pressure of ~$5 \cdot 10^{-8}$ torr. The heating chamber, sealed with metal, is evacuated with two oil-vapor pumps with sorption traps. Data are presented on the partial pressures of residual gases and their changes as functions of the duration of operation of the installations with the sorption traps. It is demonstrated that the use of the new 5F-4E vacuum oil as a working fluid in the oil-vapor pumps is promising for the production of vacuums of ~$4 \cdot 10^{-6}$ in metallurgical pipe installations. Data are presented on zone purification of zirconium in a vacuum of $7 \cdot 10^{-8}$-$1 \cdot 10^{-7}$ torr. 5 Tables; 6 Figures; 2 Bibliographic references.

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USSR

UDC 621.79

AZHAZHA, V. M., AMONENKO, V. M., KOVTUN, G. P., RYBAL'CHENKO, N. D.

"Effect of Titanium Coatings on the Plasticity of Molybdenum"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 3, May-Jun 70, pp 59-62

Abstract: Titanium coatings cause a change in the plasticity of molybdenum. The nature and degree of the effect of the coatings depend on the thickness of the coating, the annealing conditions, and other factors. Titanium films up to 1 micron thick cause an increase in the elongation per unit length of molybdenum after annealing in the temperature range of 450-1100°C. Films 10 microns thick and more increase the plasticity of molybdenum if the annealing temperature after coating does not exceed 700°C, and they cause embrittlement after annealing above 800°C. The mechanism of the effect of titanium coatings on the plastic properties of molybdenum is discussed. Additional data are given on the effect of titanium coatings on the plastic properties of molybdenum and on the causes of the plasticizing and embrittling effect of titanium coatings.

Microphotographs of the samples after various heat treatments are presented. It is pointed out that during the process of annealing, diffusion of titanium in the surface layers of molybdenum takes place primarily with respect to the lattice defects, in particular, along the grain boundaries. In molybdenum the grain boundaries are the most probable centers of fracture. Fracture of polycrystalline

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USSR

AZHAZHA, V. M., et al, Fizika i Khimiya Obrabotki Materialov, No 3, May-Jun 70, pp 59-62

samples of molybdenum almost always begins on the grain boundary, although propagation of the fracture can have a transcrystalline nature. The diffusion of titanium along the grain boundaries neutralizes the effect of the interstitial admixtures which usually are isolated along the grain boundaries and harden the boundaries. This decreases the probability of occurrence of centers of fracture along the grain boundaries and leads to a more uniform deformation of molybdenum. This explains the fact that the maximum elongation of the molybdenum samples is reached with a titanium film 1 micron thick after annealing in the temperature range of 1000-1100°C.

2/2

1/2 040 UNCLASSIFIED PROCESSING DATE--20NOV70
TITLE--APPLICATION OF THE METHOD OF SECONDARY ION ION EMISSION TO THE STUDY OF PROCESSES OCCURRING DURING THE INITIAL STAGES OF TITANIUM
AUTHOR-(04)-ABRAMENKOV, A.D., AZHAZHA, V.M., FOGEL, YA.M., SHVACHKO, V.I.

A

COUNTRY OF INFO--USSR

SOURCE--FIZIKA METALLOV I METALLOVEDENIE, VOL. 29, MAR. 1970, P. 519-523

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--TITANIUM, MOLYBDENUM ALLOY, METAL VAPOR DEPOSITION, BIBLIOGRAPHY, METAL COATING, INTERMETALLIC COMPOUND, REFRACTORY METAL, METAL DIFFUSION, SPECTROGRAPHIC ANALYSIS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3001/0069 STEP NO--UR/0126/70/029/000/0519/0523

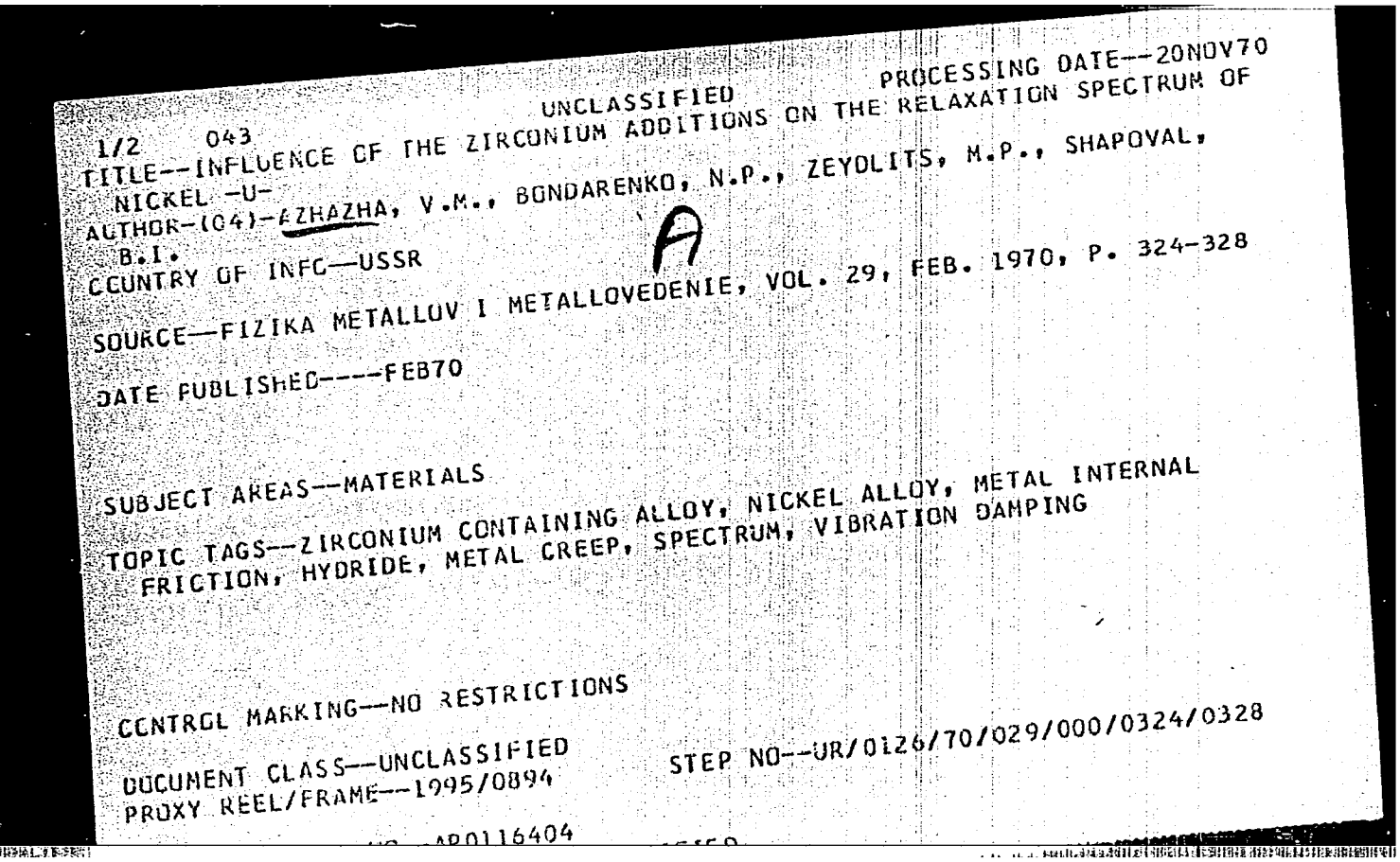
CIRC ACCESSION NO--AP0125904
UNCLASSIFIED

2/2 C4C UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0125904

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STUDY OF THE INITIAL STAGES IN THE FORMATION OF A VAPORIZATION COATING OF TITANIUM ON MOLYBDENUM, USING SECONDARY ION ION EMISSION AND MASS SPECTRAL ANALYSIS. IT IS DEMONSTRATED THAT DURING COATING FORMATION, MOLYBDENUM ATOMS DIFFUSE FROM THE SUBSTRATE INTO THE COATING. THESE ATOMS DO NOT FORM INTERMETALLIC COMPOUNDS WITH TITANIUM. FACILITY: AKADEMIIA NAUK UKRAINSKOI SSR, FIZIKO-TEKHNICHESKII INSTITUT, KHARLOV, UKRAINIAN SSR.

UNCLASSIFIED



UNCLASSIFIED PROCESSING DATE--20NOV70

1/2 043

TITLE--INFLUENCE OF THE ZIRCONIUM ADDITIONS ON THE RELAXATION SPECTRUM OF NICKEL -U-

AUTHOR-(04)-AZHAZHA, V.M., BONDARENKO, N.P., ZEYDLITS, M.P., SHAPOVAL, B.I.

A

COUNTRY OF INFO--USSR

SOURCE--FIZIKA METALLOV I METALLOVEDENIE, VOL. 29, FEB. 1970, P. 324-328

DATE PUBLISHED----FEB70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--ZIRCONIUM CONTAINING ALLOY, NICKEL ALLOY, METAL INTERNAL FRICTION, HYDRIDE, METAL CREEP, SPECTRUM, VIBRATION DAMPING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

STEP NO--UR/0126/70/029/000/0324/0328

PROXY REEL/FRAME--1995/0894

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2/2 043 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSICN NO--AP0116404

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STUDY OF THE EFFECT OF ZIRCONIUM ADDITIONS (UP TO 0.5PERCENT) ON THE BEHAVIOR OF INTERNAL FRICTION IN NICKEL SUBJECTED TO CREEP. IT IS FOUND THAT ZIRCONIUM CONTENTS OF 0.1 AND 0.3PERCENT INCREASE THE MAXIMA (ON THE RELAXATION SPECTRUM CURVE) THAT ARE DUE TO MAGNETOMECHANICAL DAMPING, GRAIN BOUNDARIES, AND BLOCK STRUCTURE, RESPECTIVELY. ZIRCONIUM CONTENT OF 0.5PERCENT DECREASES THESE MAXIMA. IT IS SUGGESTED THAT 0.3PERCENT ZR CORRESPONDS TO THE SOLUBILITY LIMIT OF ZR IN NI. THE PEAK DETECTED ON THE CURVE OF INTERNAL FRICTICN IS SUGGESTED TO BE DUE TO THE PRECIPITATION OF ZIRCONIUM HYDRIDE. FACILITY: AKADEMIIA NAUK UKRAINSKOI SSR. FACILITY: FIZIKO TEKHNICHESKII INSTITUT, KHARKOV, UKRAINIAN SSR.

UNCLASSIFIED

1/2 037 UNCLASSIFIED PROCESSING DATE--11SEP70

TITLE--EFFECT OF ANNEALING CONDITIONS ON THE MECHANICAL PROPERTIES OF PURE NIOBIUM AND MOLYBDENUM COATED NIOBIUM -U-

AUTHOR--AMONENKO, V.M., AZHAZHA, V.M., KOVTUN, G.P.

COUNTRY OF INFO--USSR

SOURCE--FIZ. KHIM. MEKH. MATER. 1970, 5(6), 733-4

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--NIOBIUM, HIGH PURITY METAL, METAL COATING, MOLYBDENUM, METAL FILM, GAS CONTAINING METAL, VACUUM ANNEALING, METAL DEFORMATION, GRAIN SIZE, METAL RECRYSTALLIZATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1988/0622 STEP NO--UR/0369/70/005/006/0733/0735

CIRC ACCESSION NO--AP0105601

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UNCLASSIFIED PROCESSING DATE--11SEP70

2/2 037

CIRC ACCESSION NO--AP0105601

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECT WAS STUDIED OF RESIDUAL GASES IN VACUUM ANNELAING (5 TIMES 10 PRIME NEGATIVE4 MINUS 5 TIMES 10 PRIME NEGATIVE7 TORR) AT 1000-1600DEGREES ON PURE NB. THE EFFECT OF THIN FILMS OF MO ON NB PROPERTIES AFTER ANNEALING IN VACUO WAS STUDIED ALSO. SPECIMENS (12 TIMES 2 TIMES 1 MM) WERE MADE FROM ROLLED BANDS (DEFORMATION DEGREE 80PERCENT) AND ANNEALED FOR 1 HR AT 1000-1600DEGREES. WHEN THE VACUUM WAS 5 TIMES 10 PRIME NEGATIVE7 TORR, THE TENSILE STRENGTH OF NB WAS LESS THAN THAT WHEN THE VACUUM WAS 10 PRIME NEGATIVE4 TORR; THE RELATIVE ELONGATION INCREASED. HOWEVER, ANNEALING AT IS GREATER THAN 1200DEGREES DECREASED THE RELATIVE ELONGATION, PARTICULARLY AT 10 PRIME NEGATIVE4 TORR. THESE CHANGES ARE DUE TO THE DEVELOPMENT OF PRIMARY AND SECONDARY RECRYSTN. WITH INCREASING GRAIN SIZE AT HIGHER TEMPS. INCREASED TENSILE STRENGTH AND DECREASED RELATIVE ELONGATION IS ASCRIBED TO THE INCREASED GAS CONTENT IN NB. WHEN THE NB SPECIMENS WERE COATED WITH MO, ALL THE ABOVE INDICATED EFFECTS WERE CONSIDERABLY LESS; MO IS LESS AFFECTED BY GASES THAN NB.

(1)

SO: JPRS 59279
14 June 73

NATURE OF 'SMOKY' SPOTS OCCURRING ON THE SURFACE OF SILICON ALLOYED WITH BORON AFTER CHEMICAL POLISHING All- semiconductor materials

[Article by Ye. G. Azhazha: Novosibirsk, Protsessy Rosta i Struktura Monokristallicheskikh Sloyev Poluprovodnikov -- Trudy Simpoziuma, Russian, Part 2, 1969, pp 97-102]

With chemical polishing etching in a mixture of nitric acid, hydrofluoric acid and acetic acid of silicon substrates used for epitaxial and planar processes, in individual cases spots are observed on the surface in the form of smoke, the color of which varies from gray-brown to blue-violet (photograph No 14). In a number of publications there have been discussions of the phenomenon of such "smoky" spots on silicon and germanium as a result of chemical or electrochemical etching in various oxidizing etching agents. However, there is no united opinion regarding the nature of the spots and their effect on the subsequent processes. It is demonstrated that the cause of the spots is not the surface contamination since the spots can arise even when special measures are taken with respect to observing the surface cleanness [1]. A number of authors propose that the spots are films of impurities which have settled on the pickled surface -- oxides, hydrides, fluorides of silicon (or germanium) or sediment of an elementary semiconductor in amorphous or polycrystallini form [2-4]. These propositions have not been confirmed by the studies of Andrews and Gereth, who demonstrated that the "smoke" effect arises from a specific fine structure of the specimen -- a surface of the hilly type with a height of the relief no more than 300 Å [5]. However, the authors have not established the causes for the occurrence of this uneven surface.

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The spots appeared primarily in the summer in cases where the additional temperature of the etching agent T_{etch} was above 21° C, and the etching rate (on one side of the plate) exceeded 6 microns/minute. For a temperature of

AZHAZHA, Ye. G.

UNCLASSIFIED PROCESSING DATE--27NOV70

1/2 037

TITLE--IMPURITY STATES OF MERCURY IN GERMANIUM,SILICON ALLOYS -U-

AUTHOR-(03)-AZHDAROV, G.KH., TAGIROV, V.I., TAIROV, S.I.

A

COUNTRY OF INFO--USSR

SOURCE--FIZIKA I TEKHN. POLUPROV., APR. 1970, 4, (4), 774-776

DATE PUBLISHED----APR70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--GERMANIUM ALLOY, ELECTRICAL PROPERTY, SILICON ALLOY, METAL COATING, MERCURY, HALL EFFECT, ELECTRIC CONDUCTIVITY, LOW TEMPERATURE EFFECT, ELECTRON ACCEPTOR

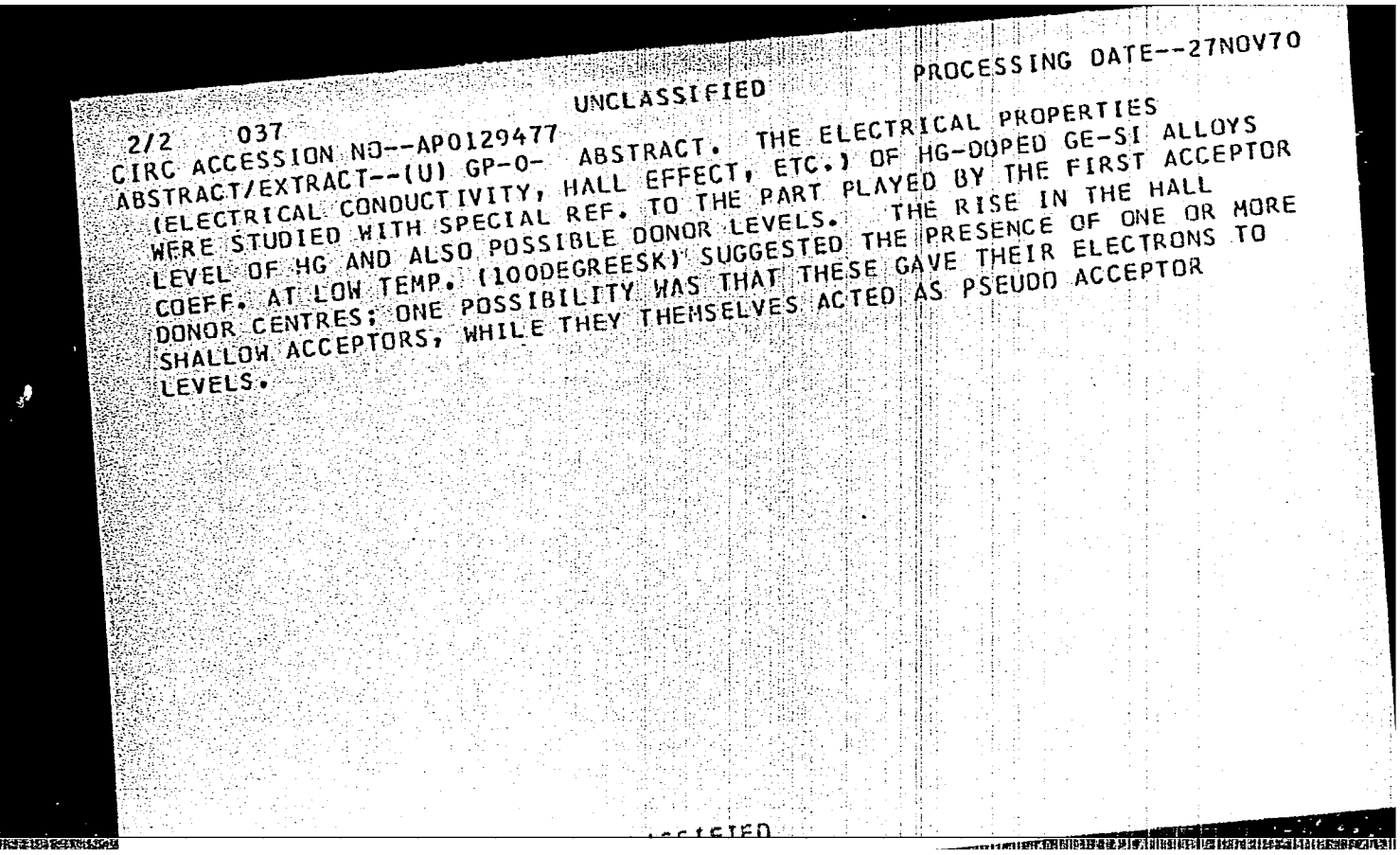
CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3003/0221 STEP NO--UR/0449/70/004/004/0774/0776

CIRC ACCESSION NO--AP0129477

UNCLASSIFIED



UNCLASSIFIED PROCESSING DATE--27NOV70

2/2 037
CIRC ACCESSION NO--AP0129477
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ELECTRICAL PROPERTIES (ELECTRICAL CONDUCTIVITY, HALL EFFECT, ETC.) OF HG-DOPED GE-SI ALLOYS WERE STUDIED WITH SPECIAL REF. TO THE PART PLAYED BY THE FIRST ACCEPTOR LEVEL OF HG AND ALSO POSSIBLE DONOR LEVELS. THE RISE IN THE HALL COEFF. AT LOW TEMP. (100DEGREESK) SUGGESTED THE PRESENCE OF ONE OR MORE DONOR CENTRES; ONE POSSIBILITY WAS THAT THESE GAVE THEIR ELECTRONS TO SHALLOW ACCEPTORS, WHILE THEY THEMSELVES ACTED AS PSEUDO ACCEPTOR LEVELS.

UNCLASSIFIED

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Pharmacology and Toxicology

USSR

SENOV, P., Professor, Honored Scientist of RSFSR, TENTSOVA, A., Docent, and AZHGIKHIN, I., Doctor of Pharmaceutical Sciences

"Biopharmacy"

Moscow, Meditsinskaya Gazeta, 15 May 70, p 3

Translation: Modern pharmacy is characterized by a revision of the concepts of the content and prospects of development of a number of disciplines related to the production and analysis of drugs. For example, in the last few years a new branch has emerged and formed: biopharmacy. This branch of pharmaceutical science deals with the relationships between the physicochemical properties of drugs in concrete medicinal forms and their biological action. The objective of biopharmacy is to investigate the effect of the assembled state and degree of dispersion of drugs, the effect of potentiating substances, the form of the drug and means of administration, the effect of manufacturing technology and other factors on the effectiveness of drugs, as well as processes of absorption, accumulation and excretion of preparations and their metabolites from the organism.

It would be difficult to overestimate the importance of biopharmaceutical research

USSR

SENOV, P., et al, Meditsinskaya Gazeta, 15 May 70, p 3

to the technology of drug manufacture and use. It is important to the patient, for example, how often insulin is administered: once or 2-3 times in one to 1.5 days. It all depends on the technology of manufacturing the preparation: if a suspension is prepared from microcrystalline insulin, it acts for 30-36 hours, and if from amorphous insulin, it acts for 12-16 hours. Potentiating substances also influence the therapeutic effect of drugs: estradiol benzoate administered in the form of an oil solution acts for only three days; but if the oil is replaced by water, the duration of action extends to three weeks. It was found that even traces of talcum retard absorption of phenacetin. All antibiotics of the tetracycline group are very poorly absorbed if potentiating substances containing ionogenic calcium or magnesium are added in the manufacture of tablets.

Biopharmaceutical investigations quite often permit not only a significant decrease in the side effects of a preparation, but also render the technology of manufacturing it more rational and profitable. It was found, for example, that if acetyl salicylic acid is pulverized 20-30 times more, half the dosage can be prescribed. This also applies to levomycetin.

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USSR

SENOV, P., et al, Meditsinskaya Gazeta, 15 May 70, p 3

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At the present time, the intensity of biopharmaceutical research is growing throughout the world. In our country, for a number of years it has been pursued at the clinics and laboratories of the First Moscow Medical Institute imeni I.M. Sechenov, and the Central Pharmaceutical Scientific Research Institute of the USSR Ministry of Health.

It is possible to diminish or completely eliminate specific side effects of psychotropic agents by altering the means of administration. At the Psychiatric Clinic imeni S. S. Korsakov of the First Moscow Medical Institute (with the participation of the Chairs of Drug Technology and Pharmaceutical Chemistry), as well as at the Central Pharmaceutical Scientific Research Institute, studies

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are in progress on the effect of means of administration and drug form on the rate of absorption of the best-known neuroleptic agents: levomepromazine and triftazin. A very interesting fact was discovered with respect to absorption and elimination of these agents: in the case of oral administration, they both usually appear in the blood within 30 minutes. On the first day, 6-20 percent of the ingested dose is excreted in the urine. Excretion in the urine continues for 6-8 days after a single orally ingested dose. During this time, none of the agent was found in the blood in any of the cases. When prescribed by rectum in the same doses, the drugs are found in the blood within 10-15 minutes, and in the urine within 5-10 minutes; 30-40 percent of the administered drug is excreted in the urine in the first 24 hours, and the excretion process terminates within 3-4 days.

Thus, using various methods of administering these agents, physicians can regulate their level in the blood and the duration of circulation. This is of decisive importance not only in choosing the most rational drug, but also in preventing side effects. All this indicates the need to find means of rational prescription and dosage of psychotropic agents.

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SENOV, P., et al, Meditsinskaya Gazeta, 15 May 70, p 3

In the skin disease clinic of the First Moscow Medical Institute, a study was made of the effect of potentiating substances, the drug form and means of administration on the effectiveness of calcium pangamate for different forms of sclerodermia. It was proven that only with prolonged rectal administration is it possible to observe a distinct therapeutic response to the drug.

At the Central Pharmaceutical Scientific Research Institute, a study has been made of the effect of means of administration on effectiveness of prednisolone, triamcinolone, choriogonin, butadione and amidopyrine. They are usually prescribed by mouth, and choriogonine is usually administered parenterally. Steroid hormones administered per os often induce serious complications, which are particularly frequent when prescribed for a long time. They are excreted through the intestine in this case. Rectal administration of steroids provides the same therapeutic response and the same level in blood plasma, but in this case there are absolutely no lesions of the gastrointestinal tract, since much of the preparation is excreted in the urine. It was also found that rectal administration of choriogonin is just as effective as parenteral. Therapeutic doses of butadione, and particularly of amidopyrine, must be considerably reduced when administered by rectum to children.

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Thus it has been proven that to affect a pathological process successfully, one must know how absorption, distribution and accumulation of the preparation proceed when using various drug forms and different means of administration. Only in this case will drug intervention be rational and reach its mark.

One of the burning problems in modern pharmacy is stabilization of drugs. The most acceptable physical methods of stabilization, particularly of protecting unstable drugs, consist of using various membranes, protective solutions, and buffers.

Researchers are displaying equal resourcefulness in developing long-acting drugs. For example, "enclosed" tablets, which travel without changing through the digestive tract, release drugs throughout its length. Tablets have also been proposed that consist of dozens of layers (up to 50) each of which disintegrates

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SENOV, P., et al, Meditsinskaya Gazeta, 15 May 70, p 3

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Much attention is being devoted by pharmacists to materials for packaging and sealing drugs.

And, finally, one must take into consideration the distinctive features of drug action as related to the patient's age.

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1/2 025 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--CONSIDERATION OF BODY HETEROGENEITIES IN ELECTRON THERAPY OF TUMORS -U-

AUTHOR-(03)-KHVAN, G.V., NURMANOV, M.SH., AZHIGALIYEV, N.A.

COUNTRY OF INFO--USSR

SOURCE--MEDITSINSKAYA RADIOLOGIYA, 1970, VOL 15, NR 5, 54-63

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TOPIC TAGS--ELECTRON RADIATION, RADIOTHERAPY, IRRADIATION DOSIMETRY, BIOLOGIC MODEL/(U)B15MEV BETATRON

CONTROL MARKING--NO RESTRICTIONS

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CIRC ACCESSION NO--AP0120965

UNCLASSIFIED

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2/2 025 UNCLASSIFIED PROCESSING DATE--23OCT70

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ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. BODY HETEROGENEITIES EXERT AN ESSENTIAL INFLUENCE ON THE DOSE DISTRIBUTION IN IRRADIATION WITH HIGH ENERGY ELECTRONS. THE AUTHORS PROPOSED CORRECTION COEFFICIENTS FOR BODY HETEROGENEITIES WITH THE AID OF SEMIEMPIRICAL FORMULAS. BY MEANS OF A MINIATURE IONIZATION CHAMBER THE AUTHORS GIVE DETAILED DOSIMETRIC MEASUREMENTS IN HOMOLOGOUS AND HETEROGENOUS PHANTOMS FROM ALUMINUM, SULFUR, MAGNESIUM, FOAM PLASTIC, AND POLYSTYROLE IMITATING THE MUSCULAR TISSUE, BONES AND LUNGS. CONCRETE CORRECTION COEFFICIENTS OF THE INFLUENCE OF BONE, LUNGS AND AIR LAYER ON THE DOSE DISTRIBUTION DURING IRRADIATION WITH BETATRON 8-15 MEV ARE DEPICTED. FACILITY: KAZAKHSKIY N I INSTITUT ONKOLOGII I RADIOLOGII.

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FIFTH INTERNATIONAL CONFERENCE ON MAGNETIC RESONANCE IN BIOLOGICAL SYSTEMS

[Article by Academician N. M. Emanuel', Doctor of Physical and Mathematical Sciences L. P. Kayushin, and Doctor of Biological Sciences Ya. I. Azhipa: Moscow, Vestnik Akademii Nauk SSSR, Russian, No 7, 1973, pp 77-78]

The Fifth International Conference on Magnetic Resonance in Biological Systems was held on 4-8 December 1972 in New York. Seventy reports were heard. The conference was the first international scientific forum at which there were discussions of the possibilities of using contemporary physicochemical methods -- EPR and NMR -- for investigations in medicine, and so it also received another title -- the First International Conference on EPR and NMR in biology and medicine. The discussion of these questions by scientists of different countries reflects an important trend in the development of medicine in our time -- an ever-increasing role of the work of physicists and chemists.

In the presented reports were cited data obtained in study of the structure and functions of individual molecules and organelles -- a very important direction of molecular biology and biochemistry. The American scientists R. Schulman, Chien Ho and M. Raftery reported on the results of investigation of the structure of hemoglobin and functions connected with it by the NMR method. That method permits establishing the quaternary structure of hemoglobin in solutions and investigating structural changes of the molecule and the ratio of alpha- and beta-subunits. G. MacConnell, T. Asakura, G. Schlever et al used EPR in combination with the method of spin labels and double magnetic resonance. The introduction of spin labels into the hemoglobin molecule helps study not only conformational changes but also the spin states of hematic iron.

At a session devoted to the structure and function of enzymes, an interesting report on the use of Fourier transforms

to study by the method of proton resonance changes in ribonuclease was presented by J. Roberts and F. Benz (England). That method was also used by R. Richards (England) to determine relaxation times.

Nuclear relaxation in lysozyme induced by spin labelling was investigated by G. MacConnell et al. They succeeded in refining the structure of the enzyme, estimating the distance between the bonding saccharides, histidine-15 and tryptophan-123. The distances determined by the spin-label method proved to be in excellent agreement with the results obtained by means of roentgenography.

The NMR method has also been used to study the mechanism of the reaction of enzymes with phosphoenolpyruvate (A. Mildvan et al -- USA).

The report of B. Sykes et al (USA) dealt with the development and application of the stopped-flow method to study by the NMR method the enzymatic hydrolysis of lysozyme of cell walls. An interesting report was presented by E. Bradbury et al (England) on the investigation of histones and their role in the structure of chromosomes. The interaction of histones with DNA was studied by a high-resolution NMR method. O. Zardecki (USA) discussed the use of magnetic resonance to study LAK-repressors. L. P. Kayushin and Ya. I. Azhipa (USSR) presented a report entitled "Complexing of nucleotides with cytochrome C and energetically dependent processes". Discussed in the report were the results of investigation by the EPR method of oxidative photophosphorylation and also of a number of cases of hypoxia. New data were presented on the high-resolution NMR spectroscopy of complexes of cytochrome C with ATP and ADP. A number of reports dealt with study of the structure of nucleic acids (R. Tso et al and D. Keris et al -- USA).

In the reports of participants in the conference on the influence of radiation on DNA, information was presented on the formation of free radicals during gamma-irradiation of DNA molecules.

The report of A. Greslun and A. Ehrenberg (Sweden) was devoted to the formation of free radicals caused by ionizing radiation in oriented DNA. It was established that in that case radicals of cationic and anionic types form. N. Ness et al (USA) investigated the influence of ions of metals on the formation of radicals in solid DNA. U. Huttermann and A. Muller (West Germany) detected 20 different types of free radicals during the irradiation of single crystals of nucleic acid. The report of H. Box and H. Friend (USA) was devoted to study of the influence of ionizing radiation on nucleic acids by the

double resonance method, and that of W. Jones (USA) and T. Bristad (Norway) to that of DNA molecules under conditions of anoxia.

S. Chen (USA) presented a survey report on the investigation of biological membranes and models of them. N. Birdsall and A. Lee (England), in determining the relaxation time of lipids in double layers and membranes by the C^{13} NMR method, obtained information about the molecular motion of lipids. W. Hubell dwelt on study of the absorption of a photon by rhodopsin by the EPR method.

The application of spin labels gave information about the structure of the proteins of muscles (O. Griffiths, R. Jost, J. Hergel, and J. Seidel -- USA; C. Selig et al -- Switzerland). The C^{13} NMR method helped J. Smith et al (USA) study the structure and transformations of nucleic acids and their components. The reports of S. Viard and J. Elliot (England) shed light on questions about the formation of radicals -- addition products of hydrogen atoms -- in single crystals of 1-methyl-cytosine. Interesting data on the rearrangement of membranes under the effect of chemical and physical agents, obtained by the method of spin sondes, were presented by M. Selloman and H. Tempulos (USA).

At the conference there were discussions of the results of study by magnetic resonance methods of amino acids, peptides and proteins. Correlation dependences were established between the structure and functions of the active center of ribonuclease by J. Griffin et al (USA). K. Vutrich and R. Keller (Sweden) investigated low-spin states of iron in hemoproteins. A number of reports dealt with hematic iron-containing proteins and carbohydrates. At a separate session of the conference reports were presented on a new experimental technique in that area of science.

The possibilities of using physicochemical methods in medical practice were discussed at a special session -- "Potential clinical applications of magnetic resonance". H. Schwartz (USA) presented a survey of existing and potential uses of EPR. EPR can now be used to measure various important clinical parameters: the paramagnetic properties of tissues characteristic of the normal organism and the detection of new EPR signals in pathology. There was discussion of the problem of diagnosis by means of EPR of some diseases, especially cancer. EPR can be used to determine inclination toward narcomania (with use of spin labels).

D. Trudell et al studied with the EPR method the absorption and localization of volatile anesthetics in models of membranes of phospholipid molecules.

N. M. Emanuel (USSR) in a report entitled "Kinetics and free-radical mechanisms of the development of cancer", reported on the results of study of the paramagnetic properties of tissues in the process of carcinogenesis and the development of tumors and leukoses in man and animals, and also under the effect on the organism of toxic agents of the environment. The reporter discussed the role of free-radical mechanisms in the course of pathological processes and the possibilities of treatment and cure of cancer by antioxidant preparations. Ways to use EPR to study cancer and carcinogenesis were described in the reports of F. Romadian et al (USA) and S. Kaneko et al (Japan). The paramagnetic properties of nerve tissues were described by P. Nilvey et al (USA). E. Copeland (USA) discussed the possibility of studying immunological reactions of the organism to morphine by means of spin labels.

The use of the methods of EPR, NMR and double resonance in biology and medicine is opening up new and broad possibilities both for investigation of the mechanism of processes in the organism, the structure of important natural compounds in the influence of various external factors on them, but also for studying the reasons for the origination and course of disease and, and this is especially important, for seeking ways to diagnose and cure those diseases.

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SECTION III SO: Selected Periodicals FCS-82 SEPT 71

Author: Institute of Biophysics, Pushchino

Description:

(U) During this quarterly reporting period, 25 new articles were identified from the Institute of Biophysics, Pushchino. On the basis of these articles, it was possible to identify 32 new personalities with the Institute. These personalities, the subjects of the articles, and the dates are given below:

Allyeva, S. A.	All-biophysics physiology	1972
Apikoyeva, G. F.	phosphorylation	1972
Artpova, D. F.	radiation effect	1972
Azhipa, Ya. I.	radiation effect	1969
	hypoxia	1969
Bregadze, I. F.	radiation effect	1970
Busel, Ye. P.	luminescence	1970
Dmitriyeva, T. I.	radiation effect	1970
Dmitriyeva, V. A.	blood plasma	1969
Domareva, O. F.	radiation effect	1970
Dubrova, A. P.	biochemical analysis	1971
Gabulova, N. A.	muscle physiology	1971
Gonusel, Ye. E.	radiation effect	1970
Ivkova, M. N.	serum albumin	1971
Kanaukin, V. S.	phosphorylation	1971
Khokhlova, G. K.	muscle physiology	1971
Kiselov, A. N.	salivary gland	1970
Klyagina, V. P.	oligonucleotide	1970
Korol, B. A.	radiation effect	1970
Koukeleva, G. N.	biochemical analysis	1971

AZHIPA, Ya. I.

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Kuzmina, S. V.	tissue culture	1970 (47)
Mikhovich, D. S.	lactate dehydrogenase	1971 (46)
Medvedeva, I. F.	radiation effect	1971 (44)
Peshkova, L. V.	phosphorylation	1971 (45)
Pronevich, L. A.	antibiotic	1970 (50)
Rodionova, M. A.	mitochondrion	1971 (51)
Shchipakin, V. N.	phosphorylation	1971 (49)
Strobeyev, Ye. M.	radiation/vibration	1970 (52)
[illegible]	radiation effect	1970 (35)
Tsvetkov, V. D.	blood plasma	1969 (40)
Uzrikhina, N. V.	lactate dehydrogenase	1971 (48)
Vilenchik, M. M.	radiation effect	1970 (53)
Zaytsetin, A. A.	muscle physiology	1971 (42)

Dubrov and Koshuyeva (41) are associated with the Laboratory of Cell Biophysics at the Institute. Reference 52 above is of special interest since it presents an investigation of combined stresses, i.e., radiation and vibration. In addition to the above articles, five of the twenty-five (54-58) were authored by persons already identified with the Institute of Biophysics, Pushchino.

Reference 55 associates the authors of the article, L. V. Slozhenikina, V. L. Migushina, and A. M. Kuzin, with the Department of Radiobiology at the Institute.

1/2 010 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--COHERENT EXCITATION OF OSCILLATIONS BY STREAMS OF PARTICLES IN FERROMAGNETICS WITH SMALL MAGNETIC ANISOTROPY -U-

AUTHOR-(03)-AZHIYEZER, I.A., BOLOTIN, YU.L., SPOLNIK, Z.A.

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COUNTRY OF INFO--USSR

SOURCE--KIEV, UKRAINSKIY FIZICHESKIY ZHURNAL: MARCH, 1970, PP 433-7

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--FERROMAGNET, MAGNETIC ANISOTROPY, SPIN WAVE

PROXY REEL/FRAME--1999/1745 STEP NO--US/0185/70/000/000/0433/0437

CIRC ACCESSION NO--AP0128546

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APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002200220017-5"